SOUTHERN POWER AND INDUSTRY

Ad Index, page 130

JULY, 1952

In This Issue

Industrial Odors Burned 47

OXIDIZING CATALYSTS are now destroying harmful industrial odors, and fuel consumption is cut by more efficient combustion and recovery of heat from hitherto waste products.

83 Gas Engines—185,000 kw..... 50

CORPUS CHRISTI, TEXAS—Reynolds Metal Company's San Patricio reduction plant is producing over 160 million lb of aluminum annually, has three tremendous power plants including forty-one 3,000 hp engines and forty-two 3,700 hp engines—a total of 278,400 hp.

This is the first application of the highly efficient, turbo-charged four-cycle gas engines to aluminum reduction pot lines. It is the first aluminum reduction plant having integrated a-c and d-c generating power plants, independent of outside power.

Cost Cutting Suggestion System.... 56

BIRMINGHAM, ALABAMA—Tennessee Coal and Iron Division of U. S. Steel Company capitalizes on the better production ideas of 30,000 employees. Its rejuvenated employee suggestion system has paid off. An idea, plus $6.50 in used parts, brought one employee an award of several thousand dollars. Payments for 1951 ideas exceeded $25,000. Tells how T.C.I. capitalizes on the savings from many small production improvements.

For Full Table of Contents, See Page 3

Work Methods

See Page 65

ALLIS-CHALMERS

POWERHOUSE PUMPS

Use This Pump Laboratory



TO STUDY ACTUAL SUCTION CONDITIONS BEFORE CONSTRUCTION STARTS

CORRECTING PUMP SUCTION CONDITIONS after your powerhouse is built can be mighty expensive. You can avoid this danger by testing your suction bay design in this Allis-Chalmers test laboratory.

This unit will duplicate the shape and water flow conditions of your suction bay and show you just how your circulating pumps will operate after installation. You can experiment with the shape and size of the suction bay, test various positions for foundations and pilings, check the effect of adding more pumps at a later date, plot operating characteristics at various loads; in fact, duplicate almost any suction condition that you may encounter in your plant.

Available to Consulting Engineers and Power Plant Operators

The pump testing facilities of the Allis-Chalmers research laboratories are available at the West Allis, Wisconsin, Works to all consulting engineers, utilities and power plant operators concerned with large pump operation. If this pump testing laboratory can help you, call your Allis-Chalmers District Office or write Allis-Chalmers, Milwaukee 1, Wis.

A-3782

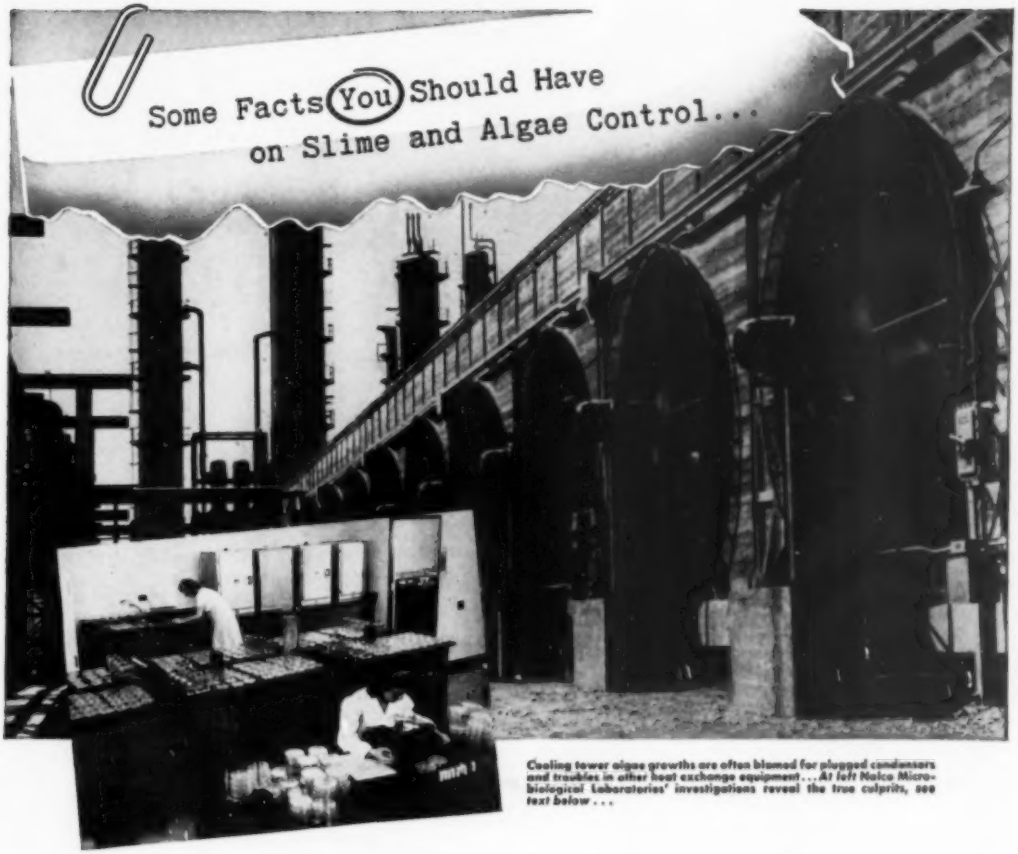
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A-C ALLIS-CHALMERS

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Volume 70 Number 7

Some Facts You Should Have on Slime and Algae Control...



Cooling tower algae growths are often blamed for plugged condensers and troubles in other heat exchange equipment... *At left* Nalco Microbiological Laboratories' investigations reveal the true culprits, see *text below* . . .

ALGAE, the trouble-makers in cooling towers, seldom cause plugging, corrosion or iron oxide deposits in other parts of cooling systems . . . Nor can mold growths, slime-forming, sulfate-reducing and iron-depositing bacteria that do cause these internal difficulties be controlled with most algae-killing chemicals.

These established facts make it obvious that proper control of microbiological growths in any cooling system is first a job for experts. Proper identification, selection of treatment chemicals and dosages, and proper points of application will be handled efficiently and economically in your plant by Nalco Field Representatives, working closely with the Nalco Laboratories. Once proper microbiological control is established, consistent supervision to check effectiveness of treatment is all that is necessary to insure clean, slime- and algae-free equipment throughout your cooling system.

Your copy of Nalco Reprint No. 6, "A Practical Approach to the Problem of Cooling-Water Slime," will be sent promptly upon request . . . If your slime and algae control problem requires corrective action, now, write or call for a Nalco Field Representative.

FORMULA FOR SUCCESSFUL SLIME AND ALGAE CONTROL

- Identify slime-forming organisms to be controlled.

A NALCO SERVICE

- Determine the best types of treatment to be used.

A NALCO SERVICE

- Determine, by detailed survey, the proper method of application.

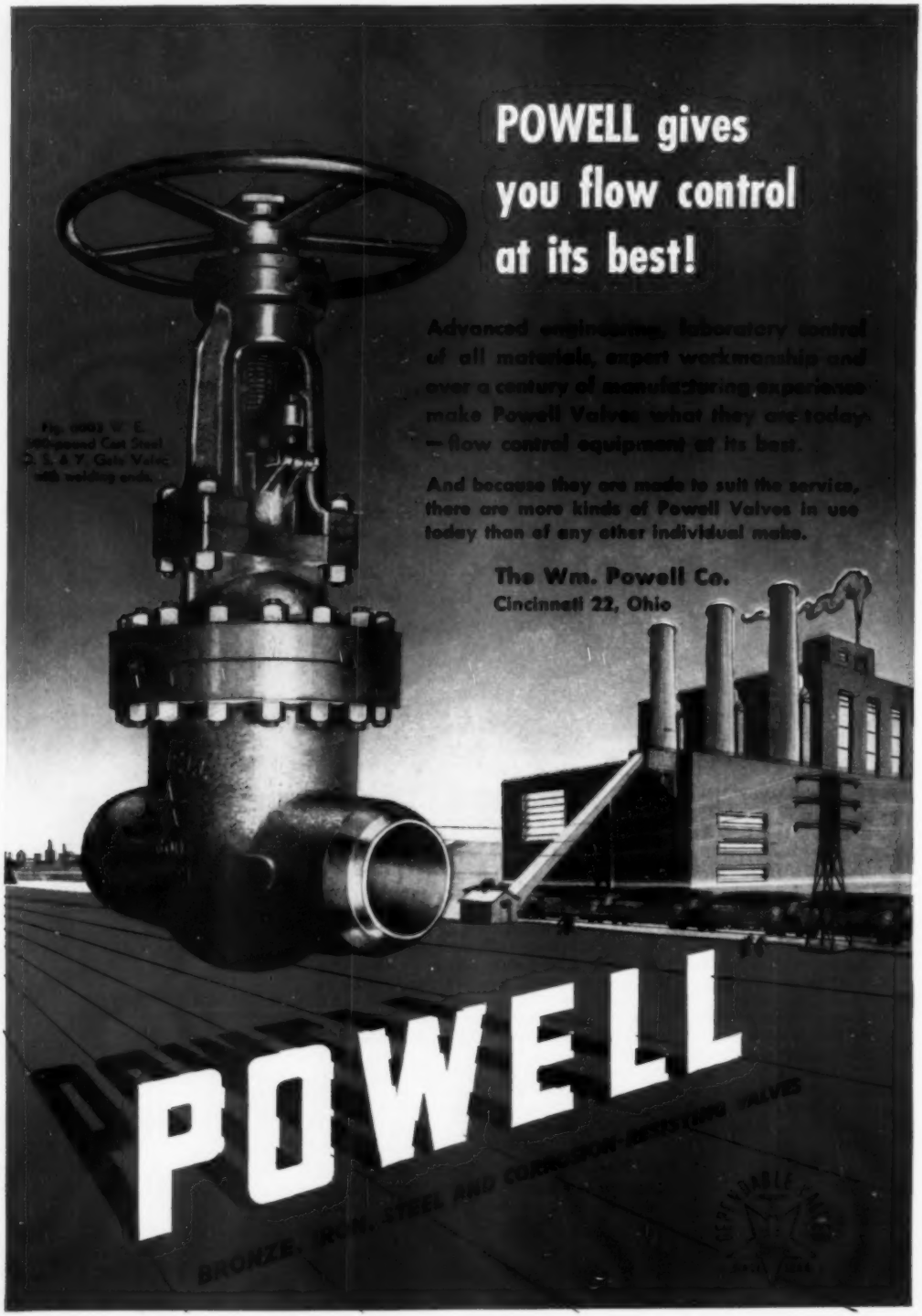
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- Provide consistent supervision to check application and effectiveness of treatment.

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NATIONAL ALUMINATE CORPORATION
6226 West 66th Place • Chicago 38, Illinois
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario, Canada

THE *Nalco* SYSTEM • Serving Industry through Practical Applied Science


POWELL gives you flow control at its best!
Advanced engineering, laboratory control of all materials, expert workmanship and over a century of manufacturing experience make Powell Valves what they are today — flow control equipment at its best.
And because they are made to suit the service, there are more kinds of Powell Valves in use today than of any other individual make.
The Wm. Powell Co.
Cincinnati 22, Ohio
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SOUTHERN POWER AND INDUSTRY

JULY 1952

Vol. 70 No. 7

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Facts and Trends

FOR SOUTHERN INDUSTRIAL AND POWER EXECUTIVES

July, 1952

► POWER FOR ALUMINUM PRODUCTION is an item of considerable magnitude in the Southern industrial and power field. By the end of 1953, six Southern and Southwestern states will be producing approximately 55 per cent of the country's primary aluminum. Semi-technical descriptions of three of the big new reduction plants -- Alcoa at Point Comfort, Kaiser at New Orleans, and Reynolds at Corpus Christi -- have been featured in SP&I.

Kaiser at New Orleans, the largest primary producer in the country, generates 478,200 kw from two power plants. Two potlines, now in operation, are fed by 80 Nordberg radial gas engines rated 1820 hp at 400 rpm and driving 1290 kw d-c G.E. generators. Power for the remaining 6 potlines and plant services will be produced by a semi-outdoor steam plant -- 15 steam generators and 16 turbo-generators.

Alcoa at Point Comfort now has 194 gas engines with a rating of approximately 350,000 hp. Original plant, constructed in 1950, included 120 engine-generator units, 40 of them housed in each of three buildings. 74 new units have recently been installed in two additional buildings. All 194 Nordberg engines are of the two-cycle, radial type, driving Elliott generators.

Reynolds' $80 million reduction plant at Corpus Christi (featured in this issue) has three power plants with 83 gas engines having a rating of approximately 278,400 hp. 33 Cooper-Bessemer gas engines produce power for one of two aluminum pot lines, each engine driving a 2,500 d-c generator. Second plant has 41 General Motors' gas-burning diesels driving 2,000 kw d-c generators. Third plant has 9 additional Cooper-Bessemer supercharged gas engines identical to the 33 unit plant.

Alcoa's $80 million lignite-fueled plant at Rockdale, Texas, is over 50 per cent complete. Power plant was designed and will be operated for Alcoa by Texas Power & Light Company. Plant will be supplied with lignite, which has been crushed and dried for use directly as fuel. Later, a carbonization plant will be installed to remove low-temperature tars from the lignite. Remaining "char" will be used for fuel, and valuable chemical by-products recovered.

► CATALYSTS -- those interesting chemicals which react continuously with products to be transformed and revert to their original state after the reaction -- are again in the industrial limelight. In 1949, Eugene Houdry developed an oxidizing catalyst to burn carbon monoxide given off by engines using unleaded gasoline and convert it into harmless carbon dioxide. Over 1000 installations were made on industrial trucks operating inside factory buildings and several trial installations were engineered for diesel engines.

Similarly oxidizing catalysts are now destroying harmful and unpleasant industrial odors and burning them up completely. At the same time, by a more efficient combustion and recovery of heat from hitherto waste products, it is CUTTING CONSUMPTION OF FUEL almost unbelievably. Check the Timely Comments page in this issue for applicational data on the first industrial process application.

Other installations of the catalytic unit which BURNS ODORS AND SAVES FUEL, include a printing firm, a dyeing company and an oil refinery. Possibilities of applying the catalyst to the synthetic finishing industry and also in connection with combustion in power boilers have been mentioned.

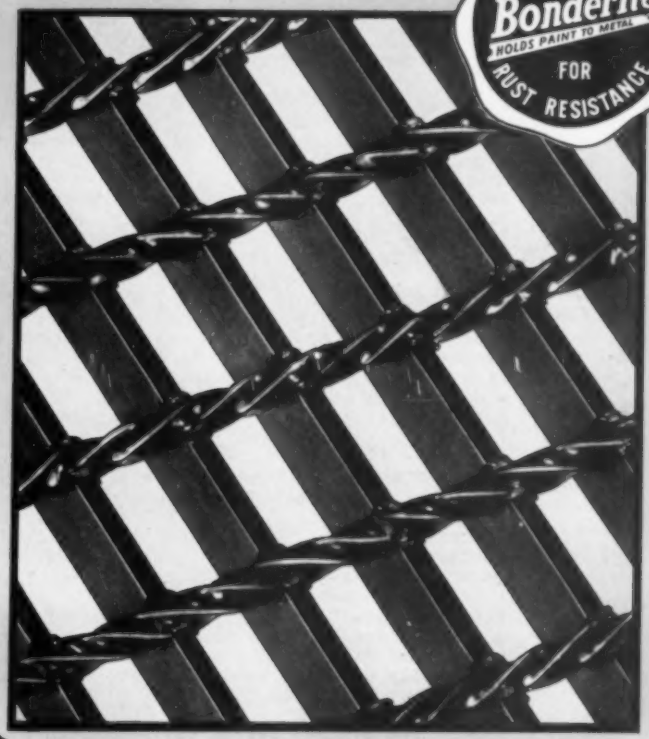
(Continued on page 6)

KERRIGAN *a Great Name in Grating*

With the WELD that Never Fails!

PROTECTED BY Bonderite HOLDS PAINT TO METAL FOR RUST RESISTANCE

Kerrigan grating is a one-piece INSEPARABLE unit. Bearing bars and crossbars are WELDFORGED by Kerrigan's exclusive process into ONE PIECE. Resulting grating is a strong, anti-slip, easy-to-clean grating that affords maximum light and ventilation, a minimum of installation and maintenance expense, and long years of trouble-free use.



BONDERIZED for rust resistance and extra protection against corrosion! Holds paint to metal for durable finishes.

Write for **CATALOG AND SPECIFICATION SHEETS** and for a copy of "A PICTURE STORY OF KERRIGAN" which shows how KERRIGAN ***Weldforged*** steel grating is custom engineered . . . and how Kerrigan's Never-Fail Weld stands up under the severest kind of punishment. Just write on your letterhead for free copy.

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► VAPORIZATION COOLING is one of the most interesting developments in the transformer field. The Westinghouse idea is based on the use of fluorocarbons — they have low boiling points, and their vapors, particularly at slight pressure, are excellent insulators. Dielectric strength compares with oil and they are thermally stable and relatively inert.

In a fluorocarbon transformer, a small amount of the liquid — few gallons at the most — is sealed inside the unit. When the transformer is energized, a motor-driven pump lifts the liquid from a sump to nozzles at the top of the transformer, where it is directed onto the hot windings. The liquid vaporizes, carrying large quantities of heat to the tank walls, radiators, or heat exchanger. Vapor gives up its heat, condenses, and returns to the sump to repeat the cycle.

These transformers are still in the development stage but in the near future will offer industrial plants several obvious virtues. Such units are free from fire or explosion danger, because the liquid is fireproof. The fluorocarbon transformer will be smaller and lighter than an equivalent liquid-immersed transformer.

► PRESSURE-SENSITIVE TAPES can save time and materials on many production and maintenance jobs. There are more than 30 different kinds, with backings of cellophane, plastic, laminated construction, cloth, paper, and metal foils.

Select them for the job — paper tapes will not withstand abrasion; flatback tapes have little stretch; and cloth tapes, because of their ability to stretch under strain, may actually do some jobs better. Crepes can withstand considerable punishment.

Narrow width tape is NOT CHEAPER than wider widths. A half-inch width actually costs more than one half the cost of the one inch width, because of the high waste that occurs in the slitting process. For heavy work, wide widths save time and do a better job. Amount of tape wasted in spiraling narrow width in order to cover a wide area is astounding. STICKINESS is not indicative of HOLDING POWER. Latter depends upon area of adhesive surface in contact with the material to be held.

► INDUSTRIAL PLANTS are prone to emphasize the spectacular or dramatic achievements in methods improvement and overlook or underestimate the possibilities of the obvious. Particularly in cost reduction campaigns, there is a tendency to concentrate on a few large, ambitious projects and to ignore the value of accumulated savings from many smaller undertakings.

The Tennessee Coal and Iron Division of U. S. Steel in Birmingham, Alabama, recently gave their 40 year old suggestion system the proverbial "shot in the arm" and are now tapping the imaginations, not merely of a few hundred foremen, superintendents, and department heads, but of all 30,000 of the division's employees.

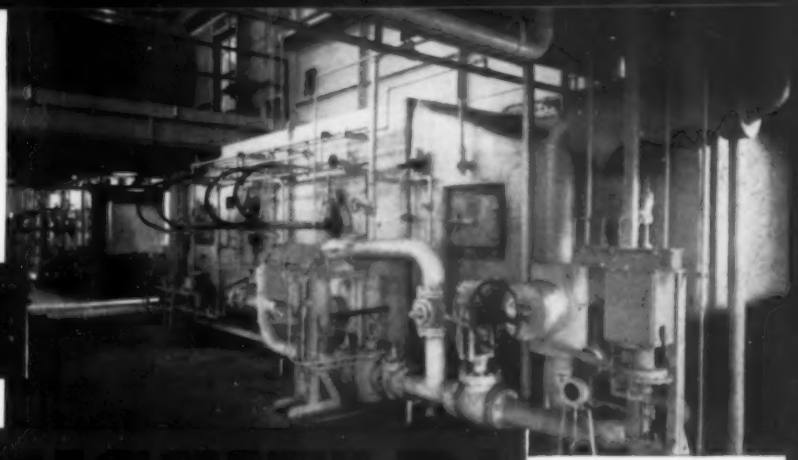
One of the highest awards yet presented under the company's liberal employee suggestion plan is featured in this issue and supplemented by a brief description of how the system operates. Marvin E. Brown, a section foreman of the Docena Coal Mine suggested the design for a new type mine conveyor system. It was a simple gadget — a new method of connecting conveyor pans which carry coal back from the working face to waiting mine cars. The award to Marvin Brown ran in four figures. Since 1948, TCI has paid out some $55,000 to employees for worthy ideas. They report that ideas, methods and tools from the man-in-the-plant have paid off.

Write the editors for additional information on any of the above items.
SOUTHERN POWER & INDUSTRY 806 Peachtree St., N.E. Atlanta 5, Ga.

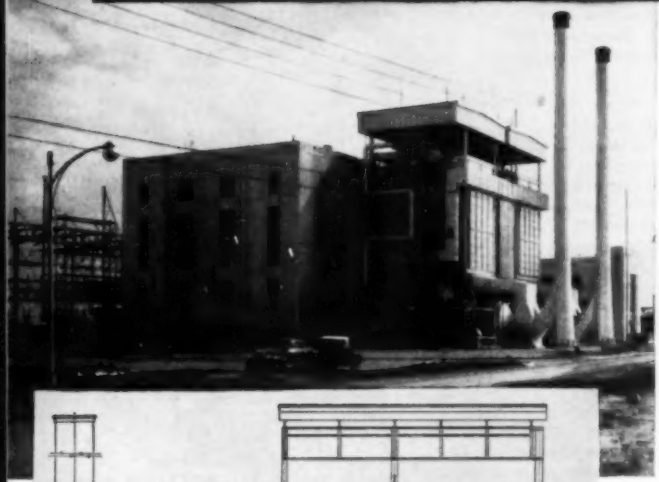
The W. R. (Bob) Poage Steam Plant, Belton, Texas, an outstanding example of modern, outdoor installation, features TWO Springfield Steam Generating Units. *Consulting Engineers:* Laramore and Douglass, Inc., Chicago, Illinois.

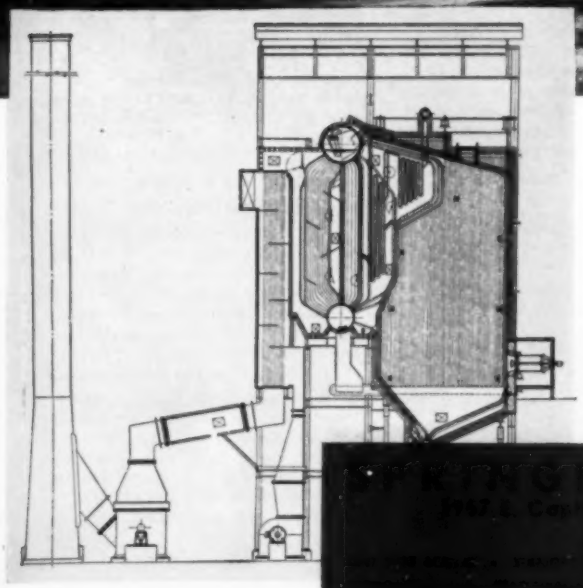
Right:—A view on the operating floor showing firing arrangement of Springfield Steam Generators.

Below:—The design cross-section.



SPRINGFIELD





. . . a story of multiple sales

SPRINGFIELD Steam Generating Units combine modern design and efficiency with low initial and operating costs. That is why Springfield Boiler Co. enjoys so many repeat orders. For example, less than two years after the initial installation, this duplicate unit was added to the W. R. (Bob) Poage Steam Plant at Belton, Texas, to provide additional economical, trouble-free capacity.

Springfield specializes in the design and production of modern, efficient steam generating equipment—TAILORED TO SPECIFIC NEEDS—of size—pressure—temperature—and fuel. For economy, for ease of operation, for long, trouble-free service, write Springfield Boiler Co. today.

DESIGN DATA

Capacity	130,000 lbs. per hr.
Operating Pressure	630 psig
Total Steam Temperature	825°F.
Number of Drums	2
Type	Bent Tube
Fuel	Oil or Gas
Installation	Outdoors

SPRINGFIELD BOILER CO.
2947 E. Cotton St., Springfield, Mo.

WRITE FOR LITERATURE ON DESIGN AND INSTALLATIONS

NEW EQUIPMENT for Southern Industry

Free additional information is available to readers of Southern Power & Industry. Check item number on the postage free service coupon post card—page 17.

Small Parts Cleaning Unit For Shop Maintenance Work

H-1 STORM-VULCAN, INC., 2225 Burbank St., Dallas, Texas, announce a new model Turbo-Blast Washing Machine for use in shops requiring a smaller parts cleaning unit. This new model, known as the Turbo-Blast Jr., has the same standard Turbo-Blast impeller which causes tremendous agitation of the solution. The solution agitation is equivalent to vigorous handbrushing action and labor time is reduced as much as one third in most cleaning applications.

The solution agitator is powered with a ½ hp motor—no air is used for agitation. The machine constantly filters the cleaning solution and is equipped with a Power Rinse device. It has an automatic safety feature which closes the lid instantly thus smothering flame in the event of fire when a volatile cleaning solution is being used. It is moved right up to the job on easy rolling casters.



Storm-Vulcan's Turbo-Blast Washing Machine for shop maintenance work —(1) Safety Fusable Link; (2) Clean Solution Tank; (3) Filter; (4) Solution Settling Tank; (5) Power Rinse; (6) Cleaning Compartment and Basket; and (7) Impeller.

The Turbo-Blast Jr. is 35½ in. high, 29½ in. wide, and has a tank depth of 17 in. The parts basket measures 26 in. long, 14 in. wide and 6 in. deep.

Water Treatment Method

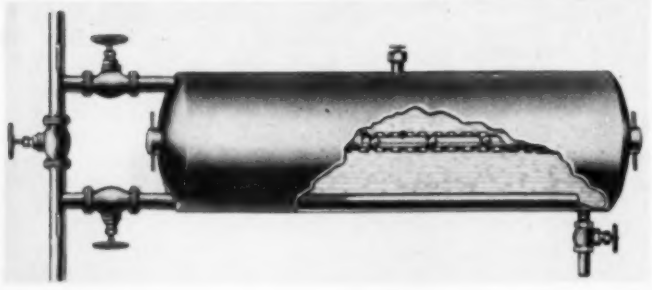
H-2 SOLA CATALYTIC COMPANY, 520 Browder St., Dallas, Texas, has announced the Sola catalytic process for the treatment of industrial and potable water to eliminate scale and reduce rust and corrosion in boilers, air conditioning and cooling systems, gas and diesel engines, condensers, water heaters and other processing equipment.

The catalytic treatment is instantaneous and can be effected at a distance far from the installation where the water is to be utilized. Apparatus consists of a cylindrical tank having a chamber which encloses the catalytic cells. Raw water is admitted to the tank through a special header located inside the tank. On leaving the header, raw water becomes subject to the catalytic action of the cells. There is an acceleration of chemical reactions and dispersion of the mineral elements which are partially or completely polymerized.

Manufacturer emphasizes that the Sola process does not cause any electrolysis in any part of the entire installation. Its catalytic action is highly recommended for elimination or great reduction of corrosion resulting from the low pH or from highly oxidized conditions.

For more information circle the item code number on the reader service post card on page 16. Sola's 6-page bulletin covers process, installation, operation, applications, and servicing. Ten installations most usually employed in industry are shown with assembly diagrams.

Water treatment by *Sola Catalytic Company's* process does not change the chemical structure of the water. The catalytic process disperses the elements in water that form scale and corrosion. Process also eliminates odors by chlorination, need for dosing and periodic analysis.



Fiberglas Pipe Insulation

H-3 OWENS-CORNING FIBERGLAS CORPORATION, Toledo 1, Ohio, is offering dual temperature pipe insulation, a new low cost scientifically designed Fiberglas insulation for pipe lines operating at low temperatures or at alternate cycles of high and low temperatures.

This dual temperature pipe insulation is made of fibrous glass bonded with a thermosetting binder and is accurately preformed in easy-to-apply semi-cylinders and segments that fit all standard pipe and tubing sizes.

A vapor barrier, composed of lami-

(*Continued on page* 10)



"Major utilities now grant complete acceptance to inhibited turbine oils"



. . . and here's why so many of them choose SHELL TURBO OIL

Shell Turbo Oil exceeds every accepted specification for premium turbine lubricants. These are the notable qualities:

1. HIGHEST ATTAINABLE RUST PROTECTION

An effective *combination* of rust inhibiting additives goes to work at the source of rust formation. Rust problems are reduced to the very lowest level.

2. COMPLETE OXIDATION STABILITY

The anti-oxidant in Shell Turbo Oil has so far defied improvement! It provides outstanding oxidation stability and thereby minimizes sludge formation.

3. ANTI-FOAMING

The anti-foam agent now used is so effective that air entrainment can be tolerated for considerable periods . . . avoiding unscheduled shutdowns.

4. EXCELLENT EMULSION CHARACTERISTICS

Shell Turbo Oil's remarkable protection against rust and oxidation is attained with the minimum tendency to formation of water emulsions in service.

5. PROTECTION AGAINST WEAR

The inhibitive agents in Shell Turbo Oil *add* to the wear-reducing qualities of the specially refined oil itself, an extra margin of safety for the bearings during critical starting period.

For additional information on Shell Turbo Oil mail coupon.

SHELL TURBO OIL

SHELL

SHELL OIL COMPANY
50 West 50th Street, New York 20, N. Y.
or 100 Bush Street, San Francisco 6, Cal.

Please send information on Shell Turbo Oil.

Name_____

Company_____

Address_____

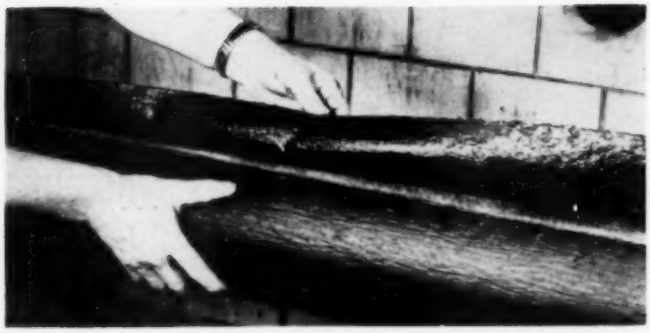
nations of asphalted kraft paper and aluminum foil adhered to the insulation with a bituminous adhesive, provides effective condensation control on cold lines passing through warmer temperatures and permits exceptionally economical operation of such pipes.

When used as a vapor barrier, the dual temperature insulation jacket prevents condensation on the surface of pipes and increases storage space by eliminating dripping in the area below the pipes.

To seal the end lap joints between sections, a four-inch strip of vapor barrier paper is supplied. These strips, together with the jack flaps, are sealed with Fiberglas vapor barrier adhesive. If desired, metal bands may then be placed at the edges of each end lap and in the center of each section.

Dual temperature insulation may be used on pipe temperatures from sub-zero to 25 F. The insulation has been designed for indoor use, but if pipes must run outdoors, a 35 lb roofing felt jacket should be placed around the vapor barrier and sealed for additional protection against the weather.

Insulation on pipes more than 12 in. in diameter is furnished in three segments. Soft copper wire is used to hold the segments of insulation in place until the vapor barrier jacket, supplied separately for these sizes, is applied.



Owens-Corning Fiberglas Corporation's Dual Temperature Pipe Insulation not only provides maximum insulating efficiency at high and low temperatures, but also prevents condensation on pipes passing through warm, humid areas.

Applicational Data

First applicational step is to coat the lap of asphalted kraft paper and aluminum foil laminate with Fiberglas vapor barrier adhesive. Flap is then brought over the top, as illustrated, and pressed into place evenly so that the vapor barrier remains intact. Another coat of adhesive is troweled along the seam for sealing. To seal the end laps between sections of insulation a 4-in. strip of vapor barrier paper, supplied with the insulation, is adhered around the joint.

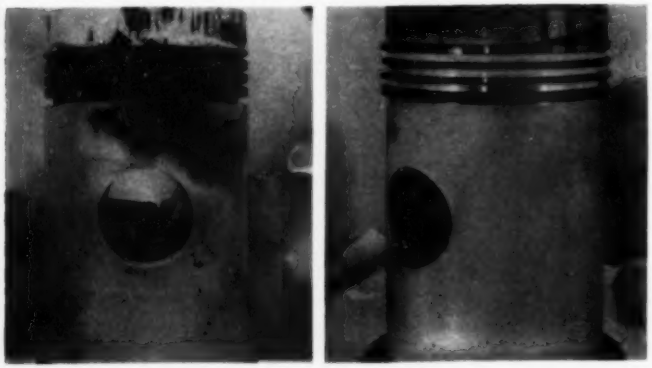
New Lube Oil for Diesel and Gasoline Engines

H-4 SHELL OIL COMPANY, 50 W. 50th St., New York, N. Y., is now marketing Shell Rimula Oil to a wide range of basic industries.

The oil was developed to solve certain problems of engine wear and fouling caused by certain operating conditions that are aggravated by low loads, high sulphur fuels and low temperature operations. Its advantages have been found most pronounced in certain diesel engines designed for increased power output on low grade fuels. The company states that higher first cost is offset by extended serviceable engine life by elimination of ring sticking and piston lacquer, with consequent reduction of oil consumption.

In the field of gasoline engines, for door-to-door and industrial truck service, the economy pattern in tests has been very similar to that established during development of Shell Rimula Oil for certain diesel engines. Data indicate that it effectively combats sludge and lacquer deposits and extends significantly serviceable life of engines by reducing cylinder, ring, piston, and bearing wear.

Comparative conditions on a diesel earth moving tractor engine show that when Shell Rimula Oil is used, at right, there is considerably less liner wear, top ring wear, and much less lacquer than when a standard heavy duty oil is used on the same engine, at left.



Light-Weight Barrier Rope

H-5 PLYMOUTH CORDAGE COMPANY, Plymouth, Mass., has introduced a new light-weight, chemical - resistant barrier rope, made of polyethylene, for marking off restricted, hazardous areas in chemical plants to protect workmen.

For such applications, the new rope has excellent resistance to acids, alkalies, mildew and rot. At present, the company is producing the new rope in ¼ in. diameter running 90 feet to the pound. It is being offered in red, white, black, yellow, olive drab or any desired combination of these colors. It has been found that a com-

(*Continued on page 98*)



At this Iowa power plant, L-B Belt Conveyors efficiently move coal from track hopper or ground storage to boiler house bunkers.

Why LINK-BELT belt conveyors are first choice in so many power plants . . .

Engineering experience plus quality components combine to cut handling costs

EFFICIENCY in moving materials makes the difference between profit and loss in many operations. That's why it's so important to make sure you get the *right* belt conveyor system for your needs.

And there's no surer way of meeting your specific operating requirements than by calling in Link-Belt. Our belt conveyor specialists can efficiently engineer the system and recommend the correct components from Link-Belt's complete line of idlers, trippers and terminal machinery. And Link-Belt can match your needs in associated equipment—other types of conveyors, feeders, elevators, car dumpers and shakers.

Equally important, with such a tremendous background in belt conveyor application, Link-Belt is in an ideal position to follow through on every detail of your job—from planning through erection, if desired. One source—one responsibility.

Link-Belt will gladly work with your engineers or consultants. There's a Link-Belt office in the principal city near you.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices in Principal Cities. 92,720

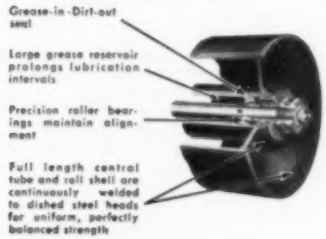
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BELT CONVEYOR EQUIPMENT

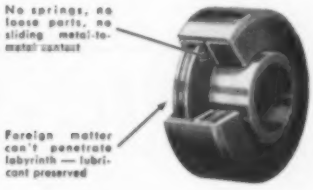
LINK-BELT Roller Bearing Idlers provide free-rolling, long life



Standard for industry—L-B "100" Idler



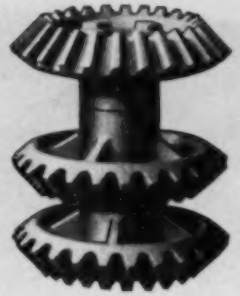
Less lubrication and adjustment



Grease-in-Dirt-out Seal

FARRELL-CHEEK GEARS

MAXIMUM PERFORMANCE and ECONOMY



Farrell-Cheek "true contour" cast tooth gears are designed, cast, and manufactured to stand up over long periods under heavy loads. Exacting standards and controls give superb wearing qualities with a minimum of backlash. Hardened wearing surfaces and tough cores provide fine, precision gears which will resist severe, abrasive wear and promote economical maintenance and operation.

Special heat-treated steels are available in a variety of analyses developed to provide the proper grade for the design of the gear and the conditions under which it will work. Hundreds of patterns in stock, and a large pattern department equipped to construct them quickly from either wood or metal, permit us to fill your specifications with accuracy and a minimum loss of time. The Farrell-Cheek service is complete . . . all of your needs, new or replacement, can be filled from one source . . . design, patterns, casting, heat treat, and machining, in one modern plant.



Hard Edge

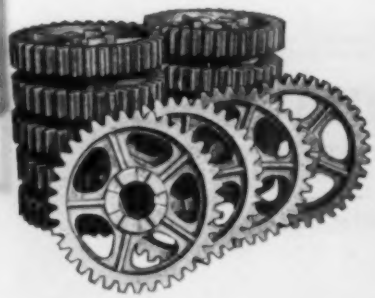


Hard Edge steels provide effective hardness at contact points of toothbearing sections with an excellent combination of strength and rigidity in the body of the castings to withstand stress, and to give long life.

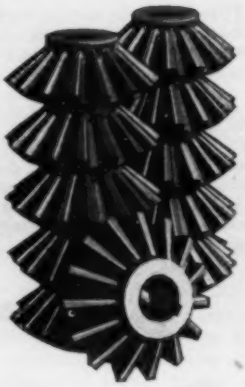
F-85



F-85 steels provide hardness of from 285 to 350 Brinell in the teeth for resistance to wear, and from 185 to 200 in sections, such as hubs, for ready machinability. Scientific heat treatment makes parts rigid, tough, and long lived.







FARRELL - CHEEK STEEL CO.

MANUFACTURERS OF HIGHEST QUALITY ELECTRIC FURNACE CARBON AND ALLOY STEEL CASTINGS

FARRELL'S CARBON STEEL CASTINGS
FARRELL'S HARD EDGE STEEL CASTINGS
FARRELL'S "85" STEEL CASTINGS

RAILROAD CASTINGS
Locomotive and Car.
R. R. Specialty Castings.

ELEVATOR, CONVEYOR PARTS
Sprockets, Traction Wheels, Chains, Buckets, Rollers, Idlers.

BUSHINGS
Carbon and Alloy Steels Machined, Hardened, Ground.

CRANE WHEELS
Overhead, Gantry, Monorail, Ingot Car, Charging Machine.

GEARS AND PINIONS
"True Tooth" Gears and Pinions, Sheaves and Wheels.

SPECIALIZED CASTINGS
Light Section Castings.

STOKER PARTS
Feed Screws, Furnace Tools, Flanged Pipe, etc.

HEAVY HARDWARE
Wire Rope Fittings, Choker Hooks, Bar Benders, Cutters.

YOUR INQUIRY WILL PROMPTLY BRING DETAILED INFORMATION PERTAINING TO ANY OF THE ABOVE FARRELL-CHEEK PRODUCTS

SANDUSKY, OHIO U.S.A.

F-85 F-C

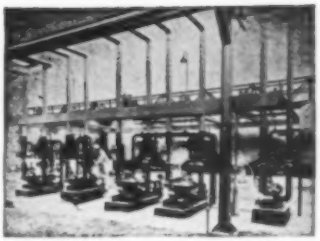
No other steam turbine offers you

SUCH VERSATILE STEAM NOZZLE CONTROL

The larger number of hand valves you see on a Coppus Steam Turbine promises you greater operating economy. At least 60% of the steam nozzles can be individually controlled to give maximum steam pressure in steam chest . . . a guarantee of best water rates at any load. Maintenance economy, too, is assured by the hard chromium plating of the shaft at the stuffing box. It provides the best possible smooth, non-corrosive surface for packing rings.



- 7 hand valves for efficient partial load operation, (20" turbine shown)
- 2 row velocity-stage turbine wheel with stainless steel turbine buckets — statically and dynamically balanced
- 30-40 carbon steel shaft
- Oversized double row deep grooved ball bearing
- Stuffing box with metallic packing ring
- Heavy chrome plating of shaft through stuffing box
- 3 nozzles always open



Coppus Steam Turbines, Type TF, driving chemical transfer pumps at Celanese Corporation of America's Chemcel Plant

Coppus Steam Turbines ranging from 150 hp down to fractional in 6 frame sizes

MAKE TURBINE DOLLARS GO FARTHER

Why waste money buying turbines with higher horsepower ratings than you need? The higher the horsepower rating, the higher the price. Save money by selecting the Coppus Turbine size closest to your requirements from 150 hp down to fractional. And when you do, you save operating and maintenance costs, too. That's what these other Coppus features are designed to do: exclusive pilot operated excess speed safety trip supplementing constant speed governor; choice of metallic or carbon ring packing assemblies. Designs available for back pressures up to 75 pounds; replaceable cartridge type bearing housings. For full details . . .

WRITE FOR BULLETIN 135

COPPUS ENGINEERING CORP., 247 Park Avenue, Worcester 2, Mass. Sales offices in THOMAS' REGISTER.

COPPUS "BLUE RIBBON" TURBINES

WITH NEW ILLUMINATOR ON

YARWAY FLAT GLASS GAGE . . .

BOILER WATER LEVEL *Shines*

It's light! It's bright! It's right! You see instantly the accurate boiler water level in your Yarway Flat Glass Gage because *the meniscus at water level stands out like a brilliant star* . . . thanks to the new Yarway Type "M" Illuminator.

The Type "M" Illuminator is specially-designed to give maximum brilliance to Yarway flat glass inserts, and to spot the water level over its entire traverse. The superior penetration of its blue-white light cuts through extraneous light, dust particles in the air, and deposits on the gage glasses. Effective over longer distances.

New or already-installed Yarway Flat Glass Gages may be equipped with the Illuminator. Yarway Illuminators may be installed in pairs on four-glass gages.

Get in touch with your nearest Yarway office for further details on this latest Flat Glass Gage development, or write direct to . . .

YARNALL-WARING COMPANY
Home Office: **116 Mermaid Ave., Phila. 18, Pa.**
Southern Representative: **ROGER A. MARTIN**
Bona Allen Building, Atlanta 3, Ga.

A COMPLETE YARWAY WATER LEVEL SYSTEM



AT THE BOILER DRUM (left) Yarway Floatless Hi-Ln Alarm Water Column with Vertical Pressure-Sealed Flat Glass Gages, Equipped with Type "M" Illuminator. See Bulletin WG-1812.

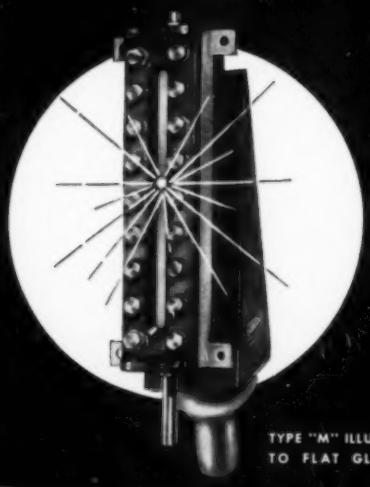


ON THE INSTRUMENT PANEL (Left) Yarway Remote Liquid Level Indicator, operated directly by the boiler water itself. Indicating mechanism is never under pressure—no sealing banks. See Bulletin WG-1822.

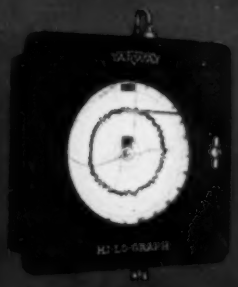
(Right) Yarway Hi-Ln Graph Recorder provides not only instant indication but also 24-hour recording of boiler water levels. See Bulletin WG-1830.

YARWAY STEAM

like a Star



TYPE "M" ILLUMINATOR ATTACHED TO FLAT GLASS GAGE INSERT







IN THE PLANT
Yarway Remote Hi-Lo Alarm Signals—light or horn. Operated by Control Unit available with Remote Liquid Level Indicator or Recorder. See Bulletin WG-1852.



PLANT EQUIPMENT

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STEAM TURBINES . . . FURNACES BOILERS, STOKERS, BURNERS

1 **STACKS, FANS, DUST COLLECTORS FOR POWER AND INDUSTRIAL PLANTS**—Catalog 200—Application data and illustrative views of Thermix fan-stacks, fans, tubular and duplex dust and soot collectors, multicyclones, and recirculators for flue gas control.—PRAT-DANIEL CORPORATION and THERMIX ENGINEERING COMPANY.

7 **WATER TUBE BOILERS**—Bulletin, 12 pages—Illustrates and describes special and standard power plant boilers and packaged steam generators. Complete engineering data, dimensions, illustrations, etc.—SPRINGFIELD BOILER CO.

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40 **OIL AND GAS BURNERS, STOKERS**—Form 1753, 16 pages—Gives descriptions, illustrations, engineering data and Selector Guide—Capacity Tables covering all fuel burning equipment.—IRON FIREMAN MFG. CO.

54 **STEEL BOILERS**—Catalog 92—Describes Kewanee steel boilers in square jacket, round jacket and various types and sizes, suitable for small and moderate operations—with charts giving ratings, specifications, measurements and application. —KEWANEE BOILER CORP.

76 **GAS BURNER** — Bulletin — Describes the Rectilinear gas burner, an application of the venturi principle which provides high input through narrow rectangular openings for firing — in a horizontal plane through fire doors or small openings over handfired coal grates or stokers — or for firing in a vertical plane on either side of stoker or oil burner.—THE WEBSTER ENGINEERING COMPANY.

84 **FINISHING - INSULATING CEMENT** — Folder J-31 — Describes a one coat finishing insulating cement for general power plant and process plant application—describes composition, adhesion, low shrinkage, set time and workability of this new product.—BALDWIN-HILL CO.

95 **DUST CONTROL** — Booklet—Describes how to increase production, reduce costs, safeguard workers' health through the installation of tailored, adequate dust control systems, carefully designed to meet your needs.—LIBERTY ENGINEERING & MFG. CO., INC.

96 **BAROMETRIC CONDENSERS**—Form 9012, 8 pages—Disc-flow and ejector-jet barometric condensers provide an economical means of condensing steam and producing vacuum. Widely used with vacuum pans and evaporators as well as steam turbines and engines.—INGERSOLL-RAND CO.

FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

106 **AIR COMPRESSOR FOR GENERAL USE**—Form 1041—Describes Model 15T, 15 hp, air compressor in engineering and application details.—INGERSOLL-RAND CO.

111 **CENTRIFUGAL PUMPS, SINGLE STAGE, DOUBLE SUCTION**—Bulletin 225—Gives exterior and sectional views, engineering features and specifications, and dimensions, rating table, etc., of Type DH and DHM single stage, double suction pumps 30 to 200 G.P.M., 20 to 170 feet total head, 1150 and 1750 R.P.M.—WARREN STEAM PUMP CO., INC.

166 **CONCENTRATORS** — Bulletin 119 and Bulletin 118—Describe the new "No Frost" concentrators, with applicational and equipment illustrations and a comparative chart which shows the development of methods.—NIAGARA BLOWER CO.

180 **ROTARY PUMPS**—Catalog LG—Brief descriptions and cross-sections of six DeLaval IMO—DeLaval rotary pumps, capacities to 1000 gpm at pressures to 500 psig, and to 150 gpm at 1500 psig—for pumping fuel oil, unloading and transferring oil, handling liquids for various power and industrial plant service.—DeLAVAL STEAM TURBINE CO.

190 **CENTRIFUGAL PUMPS**—Bulletin 1 gives a condensed listing of all types of centrifugal pumps for every service, including capacity, pressure and head range for each type. A quick reference on centrifugal pumps from A to Z.—PACIFIC PUMPS, INC.

INSTRUMENTS—METERS CONTROLS—REGULATORS

229 **BOILER GAGES** — Data Unit — Shows a complete line of Jerguson gages and valves for steam service pressures from 250 to 1500 lbs. W.S.P.—JERGUSON GAGE & VALVE CO.

237 **GLASS SPECIALTIES** — Bulletin 10-1-51—Describes Ernst glass specialties—gage glasses, tubing, discs, plates, edge glasses, cutters, etc.—ERNST WATER COLUMN & GAGE CO.

238 **SWITCH CONTROLS**—Catalog No. 600-A—Gives complete information regarding a broad line of dependable controls for various industrial requirements as well as suggested applications.—THE MERCOID CORP.

240 **HUMIDITY CONTROL** — Bulletin 302—Describes the new Type 190 Hygrostat which gives accurate humidity control—pneumatically operated and sensitive to the slightest changes.—POWERS REGULATOR CO.

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PLANT EQUIPMENT—WELDING TOOLS—PROCESS SPECIALTIES

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PIPING, VALVES, FITTINGS STEAM SPECIALTIES, TRAPS

403 **VALVE OPERATORS, SPROCKET RIMS**—Bulletin 8B—Describes and illustrates adjustable sprocket rims with chain guides, and other forms of Babbitt valve operators and controls.—BABBITT STEAM SPECIALTY CO.

404 **MALLEABLE PIPE UNIONS AND SPECIALS** — Catalog — Describes unions, union elbows, union tees, union flanges—with ground joint brass or all-iron seats. 300 lb, 250-lb and 150-lb pressures. AAR unions.—JEFFERSON UNION CO.

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538 **CHEMICAL SOOT REMOVAL** — Bulletin, 12 pages—"Chemical Removal of Soot and Slag from Boiler Furnaces"—describes development and action of Nalco SR-150, a new chemical soot remover.—NATIONAL ALUMINATE CORP.

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ENGINES, DRIVES POWER TRANSMISSION MATERIALS HANDLING

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618 **CONVEYOR SPROCKETS** — Form R.E.C. 15141 — Describes "Hard-Edge" Sprockets designed and built for rugged service in straight pull, or step and go conveying.—FARRELL-CHEEK STEEL COMPANY.

623 **MONORAIL IN THE LAUNDRY**—Bulletin LB-3 describes the advantages of handling extractor baskets with American Monorail. Complete specifications and illustrations of a special laundry lift electric hoist.—AMERICAN MONORAIL CO.

635 **GEAR COUPLINGS**—Bulletin 51—Describes the Wildcox improved Series "A" gear coupling, including standard, heavy duty, mill motor, floating shaft, Jordan, shear pin, cutouts, vertical and spacer type couplings.—JOHN WILDCOX CORP.

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680 **BABBITTED BEARINGS** — Folder 116—Describes a line of low cost precision-built babbitted bearings—for general service where shock loads are not encountered and where speeds are moderate. Available from stock.—THE JEFFREY MFG. CO.

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7-52-1

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238	240	259	284	295	314	315	326	347	350	382	371	403	404	407	419
423	431	438	442	443	465	482	491	506	532	538	561	565	574	601	616
623	635	646	680	691	737	746	758	760	784	803	804	809	831	845	851
906	907	909	911	912	914	958	984	B10	B11	B12	B13	B14	B15	B16	B17
B18	B19	B20	B21	B22	B23	B24	B25	B26	B27	B28					

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780 **CENTRIFUGAL REFRIGERATION** —Bulletin C-160-B-14 — Describes Worthington centrifugal refrigeration systems—cycles of operation, refrigerants, compressor design features, condensers, evaporators, controls, drives, etc.—WORTHINGTON CORPORATION.

784 **REFRIGERATION VALVES AND FITTINGS**—Catalog 8, 48 pages—Describes valves and fittings for ammonia, Freon and other refrigerants, for use in industrial refrigeration, ice making and air conditioning.—FRICK CO.

ELECTRICAL

803 **LIGHTING STANDARDS**—Catalog 31P, complete with engineering data and illustrations—Shows "Weldforged" lighting standards for plant property, streets, highways, playgrounds, churches, housing projects, shopping centers, plants of all sorts—also mast arms and brackets.—KERRIGAN IRON WORKS, INC.

804 **CUBICLES, PANELS, ENCLOSURES**—Descriptive Booklet—"Contract Manufacturing in Sheet Metals"—Describes job-fitted control centers, bus enclosures, cubicles, switchgear housing and other sheet metal assemblies for utility and industrial plants.—THE KIRK & BLUM MFG. CO.

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906 **INDUSTRIAL DUST COLLECTOR** — Catalog 101 — Describes the Aerotec industrial dust collector, available in self-contained, custom-built industrial assemblies which may be adapted as integral parts of existing equipment, with tube performance records given on eight representative dusts.—THERMIX ENGINEERING CO.

907 **SHEET METAL PANELS, CUBICLES, ETC.**—Descriptive Booklet — "Contract Manufacturing in Sheet Metals" describes job-tailored control centers, bus enclosures, cubicles, switchgear housings, panel and various other sheet metal assemblies for utility and industrial plant applications.—THE KIRK & BLUM MFG. CO.

909 **DUST COLLECTION**—Catalog 101, 32 pages—"The Collection and Recovery of Industrial Dusts" discusses the analysis and the collection of dusts, the choice of equipment and its operating characteristics, engineering data and special purpose collectors.—BUELL ENGINEERING CO., INC.

911 **VACUUM CLEANING**—A-710, 12 pages, describes the diversified cleaning job, particularly in the grain milling industry, performed by Hoffman heavy duty vacuum cleaning equipment.—U. S. HOFFMAN MACHINERY CORP.

912 **INDUSTRIAL INSULATION**—Catalog A91 describes Eagle-Picher industrial insulations for high and low temperature installation, with all essential data necessary to determine type, size and application. Fuel saving charts and engineering table—THE EAGLE-PICHER CO.

914 **FLAGPOLES** — Catalog 14F—Gives engineering data on "Weldforged" steel flagpoles, describing continuous straight, tapered, and sectional steel flagpoles—construction, ground and roof settings, trucks, bases and ornaments.—KERRIGAN IRON WORKS, INC.

958 **INDUSTRIAL INSULATION**—Bulletin and Samples indicate the advantages of PC "foamglas" permanent industrial insulation, made up of millions of tiny glass bubbles that prevent moisture and vapor travel. — PITTSBURGH-CORNING CORP.

984 **DUST RECOVERY** — Booklet, 32 pages—Outlines the theories and basic principles of centrifugal dust recovery, and the application of multi-clone units, with their advantages of adaptability, space saving, high efficiency and low maintenance. —WESTERN PRECIPITATION CORP.

Continued on page 126

7-52-2

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423	431	438	442	443	465	482	491	506	532	538	561	565	574	601	616
623	635	646	680	691	737	746	758	760	784	803	804	808	831	845	851
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You'll find that a Gulf Lubrication Engineer does more than simply recommend the proper oils and greases for every type of equipment in your plant. He offers effective help on every phase of lubrication.

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For additional information on this cost-saving plan, call in a Gulf Lubrication Engineer today or send the coupon below.

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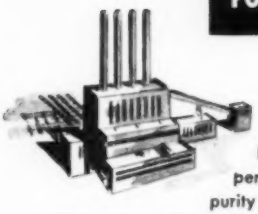


From the pioneering development in Superheaters to the

the trend in modern steam generator design

places the spotlight on . . .

FOSTER WHEELER combination radiant and convection



Today's central station calls for larger unit sizes of turbines and boilers—higher steam pressures and temperatures—and optimum quality and performance. To provide steam in the quantity, pressure, temperature and purity demanded, increased emphasis falls upon the design and function of superheaters and reheaters. Their integration with other components of equipment and plant requires the high degree of skill and experience that comes only with years of leadership in the field.

Foster Wheeler's pioneering effort in steam generator design, as reflected in the following record of achievement, has led the way for every major development in the reheat cycle.

1902 — Superheated steam introduced commercially in the United States.
1904 — Convection superheaters standardized with cast iron extended surface rings applied to steel tubes. Bare tubes were later used with improved design technique and improved metal selection.
1919 — Radiant superheaters developed after long research and experimentation.
1924 — Water walls and water backs applied to many types of furnaces burning various fuels.
1926 — Radiant reheaters and radiant superheaters installed in one of the first large high pressure reheat units in the country.
1946 — First large steam generator installed in a central station to operate over a wide load range at 1000 F final steam temperature.

As a result of this 50 years' background of experience and leadership, each new steam generator can be depended upon to have Foster Wheeler's integrated quality and performance.

FOSTER WHEELER CORPORATION • 165 BROADWAY • NEW YORK

complete reheat cycle

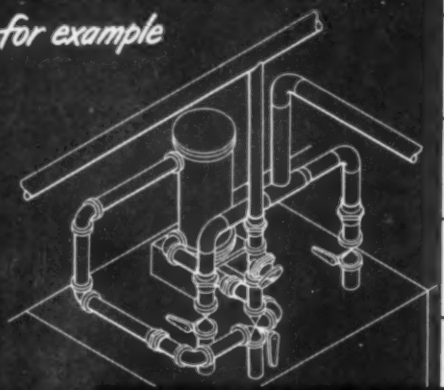


6, NEW YORK

FOSTER WHEELER

Are Your Valves Behaving This Well?

...on River Water, for example



THE INSTALLATION

Crane Iron Body Diaphragm Valves on hydraulic lines to cylinder operators on ash pit gates; Southwark Station; Philadelphia Electric Company.

VALVE SERVICE RATINGS

SUITABILITY: Good design for gritty fluid

FEATURES: Neoprene disc insert resists cutting

MAINTENANCE COST: Making big savings here

SERVICE LIFE: Already 6 to 9 times longer than other valves

CORROSION-RESISTANCE: O.K. no sign of corrosion

PRICE: Better than many ordinary valves

AVAILABILITY: Regular number in Crane line

THE HISTORY

Valves were installed in the hydraulic system when the control cocks failed to shut off tight. But like the cocks, conventional valves put in this service didn't stand up. They couldn't handle the abrasive, sandy river water used for hydraulic operators as well as for ash pit sluicing. They leaked badly in 3 to 5 weeks; had to be replaced.

The problem was solved with Crane Iron Body Diaphragm Valves. Installed more than 7 months, there's been no leakage since; no valve trouble of any kind. The Neoprene disc insert and wide, flat seating surfaces in Crane Valves show no effect of abrasion. Their completely sealed bonnet keeps working parts free of grit.

THE VALVE

In Crane Packless Iron Body Diaphragm Valves, the Neoprene diaphragm acts as bonnet seal only; is not subject to crushing and rapid wear. Separate disc with Neoprene insert shuts off flow even should diaphragm fail. Made unlined or with full Neoprene body lining. Well suited for erosive fluids, sludges, slurries; also for many corrosive services. See your Crane Catalog or call your Crane Representative.



The Complete Crane Line Meets All Valve Needs. That's Why
More Crane Valves Are Used Than Any Other Make!

CRANE VALVES

CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Illinois
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VALVES • FITTINGS • PIPE • PLUMBING • HEATING

why splice needlessly?



DURASHEATH goes *all* the way—underground, overhead, in ducts—without splices

Splicing cable is time-consuming . . . and costly. What's more it is avoidable. All-purpose Durasheath* can be used for almost any distribution need up to 5 kv.** It can be run in one continuous length, regardless of location . . . buried underground . . . strung overhead . . . or easily pulled through ducts. No expensive splices are necessary . . . no weak power links . . . no cluttered inventory. One cable—flexible, light Durasheath—goes all the way. You can stock *one* type instead of *three*.

Durasheath handles easily and is used in self-supporting aerial assemblies. Its rugged neoprene jacket resists moisture, chemicals, sunlight, organic decay, corrosion, electrolysis, abrasion, and mechanical injury.

For *reliable* power distribution at *lower* installation cost, insist on versatile Durasheath. See your nearest Anaconda Sales Office or Distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

*Trademark 52357

the right cable for the job

available in all sizes – from large to small – one to three conductors – **can be supplied for services up to 15 kv. Consult Anaconda for recommendations.



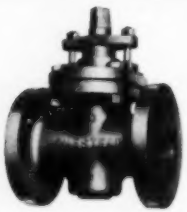
ANACONDA® wire and cable

for traffic control, airport† power and lighting, mines, industrial plants, railroads, street lighting and many other uses

†when ordered to CAA Specification L-824

WE MAKE *ALL* TYPES OF PLUG VALVES
. . . including the *right* one for *your* needs

HOMESTEAD CAM-SEALD



Straight-way—
Flanged or Screw Ends



Three-way—Screw or Flanged Ends

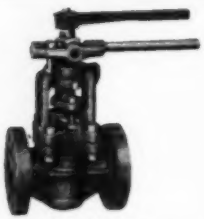


Four-way—Flanged or Screw Ends

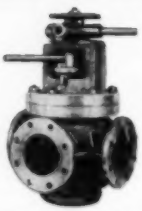
HOMESTEAD CAM-SEALD, QUARTER-TURN PLUG VALVES
(non-lubricated, or pressure-gun lubricated, as desired)

Available in metals for most valve needs; for pressures to 3,000 lbs.; temperatures to 750° F.

HOMESTEAD LEVER-SEALD



Straight-way—
Flanged or Screw Ends



Three-way—Flanged or Screw Ends



Four-way—Flanged or Screw Ends

HOMESTEAD LEVER-SEALD, QUARTER-TURN PLUG VALVES
(non-lubricated, or pressure-gun lubricated, as desired)

Made in combinations of metals and alloys to meet practically any service requirement; from 1½" to 10"; from vacuum to 1,500 pounds.

HOMESTEAD-REISER



Straight-way—
Screw or Flanged Ends



Straight-way—
Worm & Gear Operated



Flow-Changer—Non-lubricated

HOMESTEAD-REISER SELF-SEALD LUBRICATED PLUG VALVES
(100% Port Area, or Venturi, as desired)

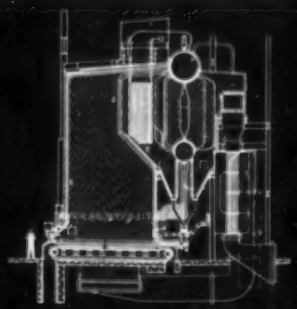
Available in semi-steel; cast steel; sizes ½" to 12" for steam pressures to 150 lbs.; oil-water-gas to 200 pounds.

We are the only manufacturer who makes *all* of the various types of plug valves used in industry . . . LUBRICATED . . . NON-LUBRICATED . . . FULL PORT . . . VENTURI. We have no "leaders." *We make them all;* therefore, we have no reason to "push" one type valve over another. Our only concern is to see that you get the *right* valve for *your* requirement.

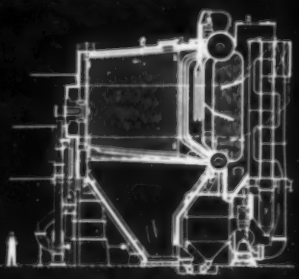
To help you keep this in mind the next time you need plug valves, we'd like to send you our catalog. Why not write for it today.

HOMESTEAD VALVE MANUFACTURING COMPANY
P. O. BOX 70 **CORAOPOLIS, PA.**

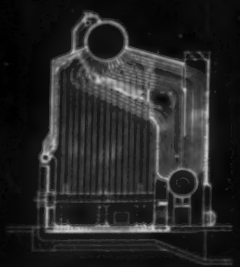
Serving since 1892



VU-40 BOILER installed in a large Southern plant. This unit is fired by coal, using C-E Spreader Stokers (continuous discharge type). Capacity of this boiler is 150,000 lb of steam per hr at a pressure of 900 psi and a temperature of 808 F.



VU-50 BOILER installed in Midwestern plant. This boiler is fired with pulverized coal using C-E Raymond Bowl Mills. The capacity is 65,000 lb of steam per hr. Steam pressure is 400 psi — steam temperature is 600 F.



VU-10 BOILER fired with oil. Installed in an Eastern plant, the boiler's capacity is 15,000 lb of steam per hr at 250 psi and 480 F. VU-10 capacities range from 10,000 to 60,000 lb of steam per hr. They may also be fired by spreader, underfeed or chain grate stokers.

Industries follow the leaders to VU

In industry after industry, you'll find leading companies are setting the pace for efficient, reliable steam production with C-E Vertical-Unit Boilers.

The Chemical Industry is a typical example. For VU Boilers have been purchased by most of the major manufacturers in this industry, including such nationally-known leaders as those shown in the list below.

Furthermore, chemical manufacturers, both large and small, have *proved* their satisfaction with Vertical-Unit Boilers by buying them again and again. In 1951, for example, more than 60 per cent of the VU capacity ordered by chemical companies represented repeat order business. One leading manufacturer, in fact, has purchased twenty-seven units during the past twelve years — *eleven of them in 1951!*

You can profit from the experience of the Chemical Industry — as from any industry where steam for power or process is of major importance. If you use steam, investigate the lower steam costs you can get through the advanced design . . . sound construction . . . proved reliability of VU Boilers. They are available in capacities to fit your needs — from 10,000 to 350,000 pounds of steam per hour.

Typical List of Chemical Companies that have purchased VU Boilers for one or more plants

Air Reduction Co., Inc.
Allied Chemical & Dye Corp.
Atlas Powder Co.
Carbide & Carbon Chemical Corp.
Colgate-Palmolive-Peet Co.
Diamond Alkali Co.
E. I. du Pont de Nemours & Co., Inc.
B. F. Goodrich Chemical Co.
Hercules Powder Co.
Merck & Co., Inc.
National Distillers Chemical Co.
Pennsylvania Salt Mfg. Co.
Pittsburgh Coke & Chemical Co.
Charles Pfizer & Co.
Shell Chemical Co.
U. S. Industrial Chemicals Co.

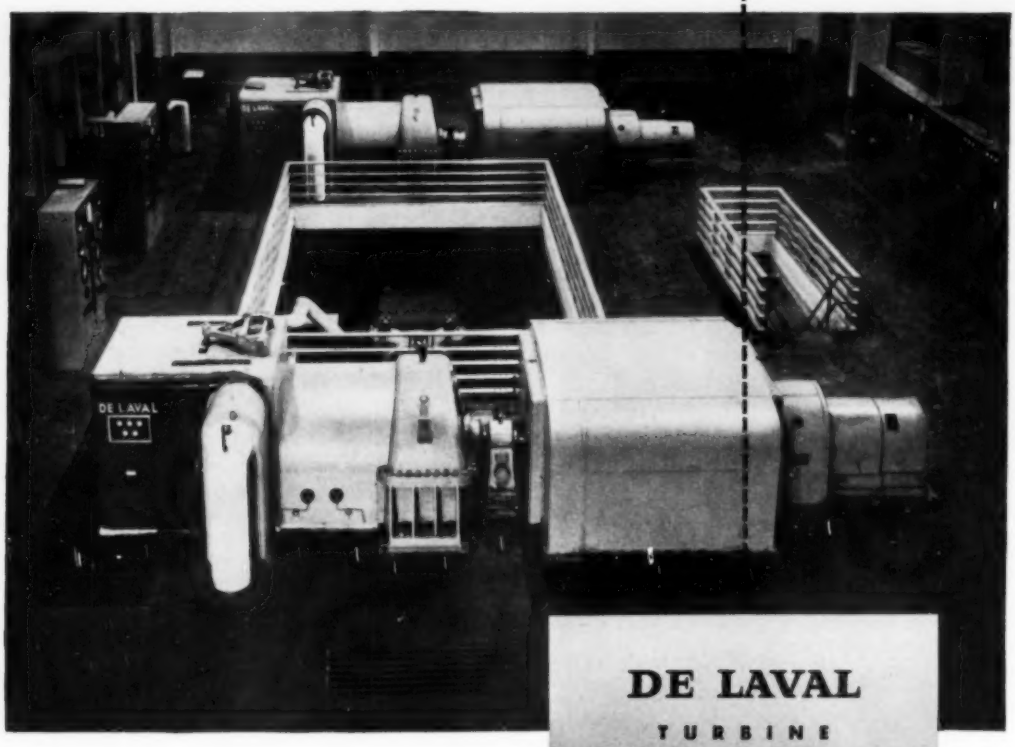
COMBUSTION ENGINEERING—SUPERHEATER, INC.

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ALL TYPES OF BOILERS, FURNACES, PULVERIZED FUEL SYSTEMS AND STOKERS; ALSO SUPERHEATERS, ECONOMIZERS AND AIR HEATERS



Two thoroughbreds for the blue grass country



You are looking at "13,400 horses" that will never run in the Derby. But these two 5,000 kw De Laval Turbine Generators, installed in the municipal power plant of the City of Henderson, Kentucky, add a new, dependable source of power to the famous blue grass country. Operating conditions are 600 psi at 825F and the turbines are arranged with three points of extraction for feedwater heating.

De Laval's modern Turbine Generators come from a long, pedigreed line. In fact, we have been building turbine generators for more than a half century. You can count on De Laval units to give you year-in, year-out service. Sizes range from 25 to 11,500 kw.

Be sure to send for complete data on our power plant equipment: boiler feed pumps, mechanical drive turbines, centrifugal pumps and IMO rotary oil pumps.

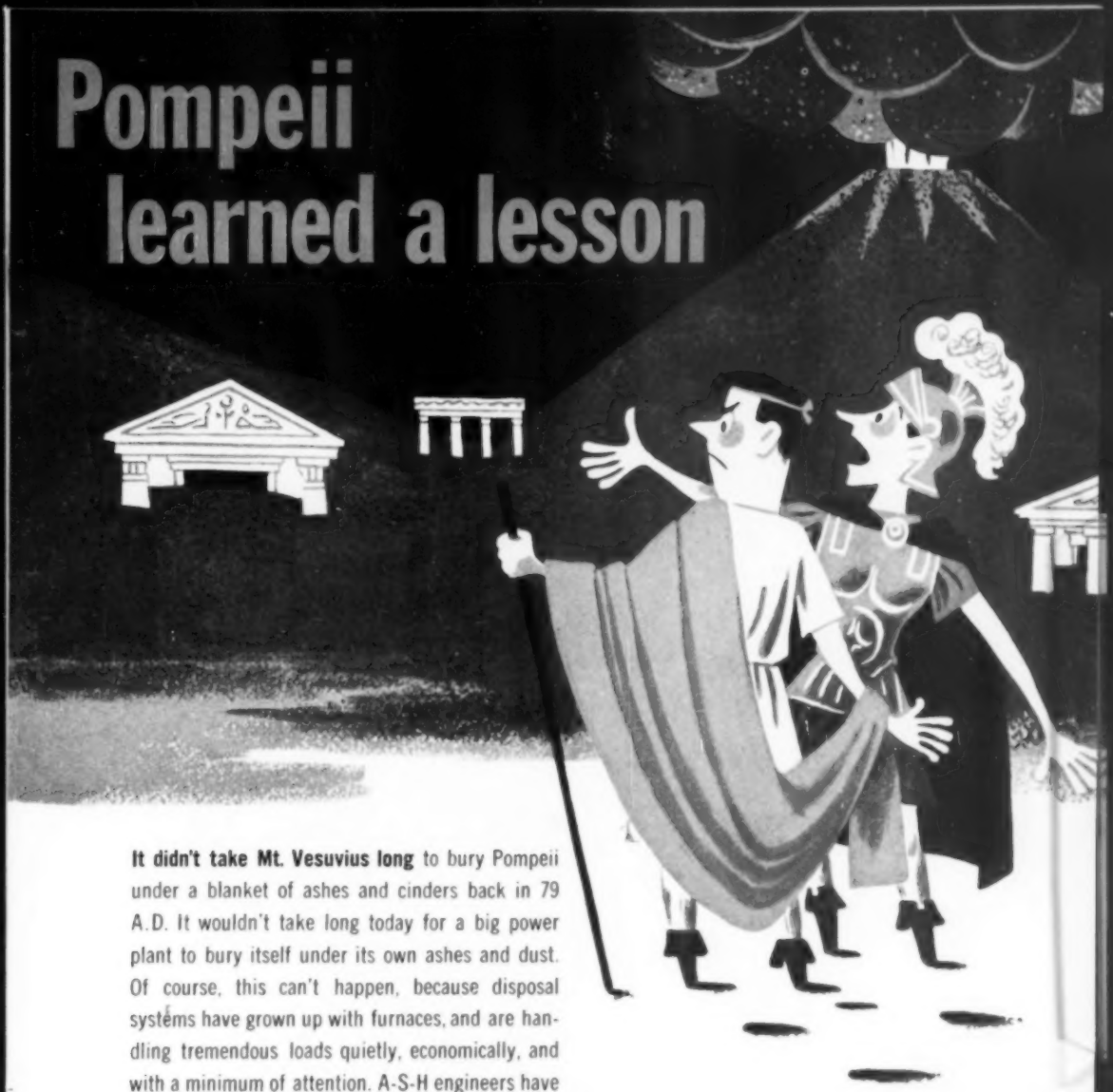


DE LAVAL *Turbine Generators*

DE LAVAL STEAM TURBINE COMPANY
Trenton 7, New Jersey

DL 189

Pompeii learned a lesson



It didn't take Mt. Vesuvius long to bury Pompeii under a blanket of ashes and cinders back in 79 A.D. It wouldn't take long today for a big power plant to bury itself under its own ashes and dust. Of course, this can't happen, because disposal systems have grown up with furnaces, and are handling tremendous loads quietly, economically, and with a minimum of attention. A-S-H engineers have done much of the pioneering work that makes these results possible. Consult them on your next project.

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Dept. L—259 E. Lancaster Ave., Wynnewood, Pa.
Offices and Representatives in Principal Cities

HYDROJET (hydraulic) **HYDROVAC** (pneumatic)

materials handling systems

CCMS

A nontechnical report to management concerning profits

They did what you can do to save time

Since time is worth money in manufacturing, then the story of this southern chemical manufacturer is important to management men in every industry.

They said in part: "Your *prompt* response to our cry for help the other night enabled us to resume operation on schedule. It was more than a service, it was a very gracious act which we will long remember."

They were unable to start their 6,000 kw turbine following a holiday shutdown. At 8 P.M. they telephoned our District Office in Atlanta. One of our Engineering and Service men left immediately and drove all night to the customer's plant. He arrived at five the next morning. Two hours later, the turbine was back in service.

This same emergency and disaster service applies to every industry, to every manufacturing process. It is a part of the total Westinghouse services you can use to your profit . . . for application, installation or maintenance.

We want to do the kind of planning with you that applies these engineering services to your problem . . . to save time, to save money, to make money, to produce more with what you have. Your nearest Westinghouse office can tell you how. Westinghouse Electric Corporation, Pittsburgh, Pennsylvania.

YOU CAN BE SURE...IF IT'S
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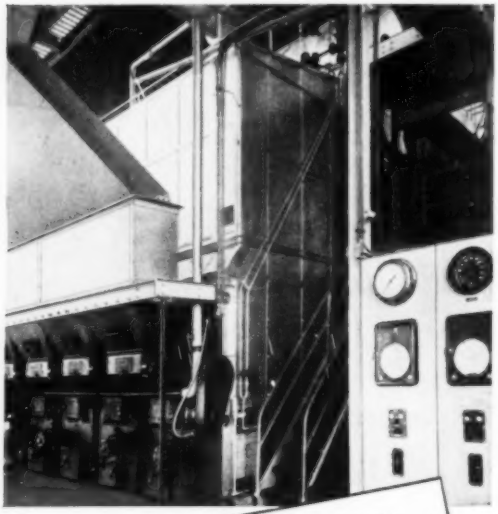
"HOW WE SAVE MORE THAN $90,000 A YEAR—

BY BURNING COAL THE MODERN WAY!"

says W. H. FISHER, Plant Engineer, Kerr Bleaching and Finishing Works, Concord, North Carolina.

"Powering our plant used to take nine boilers—now *one* does the same job *using 30% less fuel!* 6 firemen now do the work of 18—thanks to modern coal-handling equipment and automatic controls. That's why we say, you can't beat bituminous coal burned with modern equipment."





Above is a view of the plant's modern, space-saving coal-storage silo. To the left is a close-up of the firing aisle, showing the spreader stoker and the main control panel. Coal handling is automatic and dust-tight throughout. Automatic controls regulate firing, drafts and feed-water—give maximum efficiency at lowest cost.

If you operate your own steam plant, you can't afford to ignore these few down-to-earth facts!

COAL in most places is today's lowest-cost fuel.

COAL resources in America are adequate for all needs—for hundreds of years to come.

COAL production in the U. S. A. is highly mechanized and by far the most efficient in the world.

COAL prices will therefore remain the most stable of all fuels.

COAL is the safest fuel to store and use.

COAL is the fuel that industry counts on more and more—for with modern combustion and handling equipment, the inherent advantages of well-prepared coal net even bigger savings.

Burning coal the modern way can save *you* money, too! First, labor costs can be cut to a minimum with up-to-date coal- and ash-handling equipment. On top of that, today's combustion installations give you 10 to 40% more power from each ton of coal than was possible a few years ago!

If you're planning to modernize, or if you're building a new plant, call in a consulting engineer. He'll show you how you can get big savings by burning coal in a modern plant designed to meet your *specific* needs.

America's coal reserves are virtually inexhaustible; America's coal industry is the world's most productive and efficient. That's why coal has a future dependability of supply that no other fuel can offer. That's why, of all fuels, the price of coal is most likely to remain stable.

BITUMINOUS COAL INSTITUTE

A Department of National Coal Association, Washington, D. C.

FOR HIGH EFFICIENCY FOR LOW COST

YOU CAN COUNT ON COAL!



FOR CLASSY SHOPS

. . . OR BUSY PLANTS



THERMOLIER UNIT HEATERS

The condensed table below is a quick guide to the selection of the correct Thermolier for specific conditions. The capacities, when motors are operating at normal speeds, are based on Standard Basis of Rating: 2 lb. steam pressure and 60° F entering air temperature.

Grinnell Thermoliers are tested and they are rated in strict accordance with rules of the Industrial Unit Heaters Association.

All Thermoliers can be operated at working steam pressures up to 125 psi and steam temp. up to 406° F.

A MODEL AND SIZE FOR EVERY PURPOSE



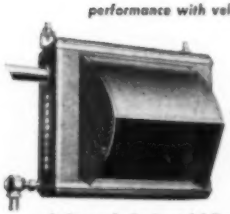
horizontal delivery



textile (horizontal delivery)



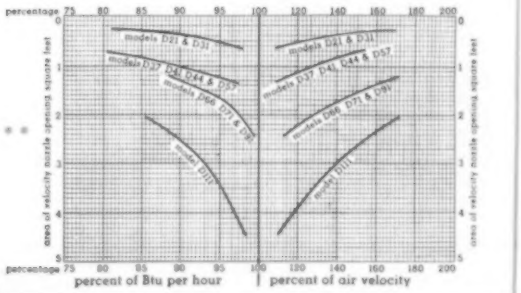
vertical delivery



velocity nozzle (horizontal delivery)

model	total heat delivered, Btu per hr	sq ft edr (nominal)	air velocity at exit, louvers open, lin. ft. per min.
horizontal delivery			
D21	35,600	148	786
D31	48,700	203	851
D37	62,200	259	753
D41	71,000	295	901
D44	84,100	350	887
D57	101,300	422	1016
D66	128,700	536	779
D71	151,700	632	977
D91	196,000	817	985
D111	275,300	1147	1048
Textile			
TX70	69,800	291	826
TX110	113,700	474	877
vertical delivery			
VA1042	50,800	212	1399
VA1045	73,600	307	1287
VA1065	109,400	456	1354
VA1075	145,600	607	1231
VA1101	185,000	770	1495
VA1111	257,000	1071	1631

performance with velocity nozzle ▶



GRINNELL
THERMOLIER UNIT HEATERS

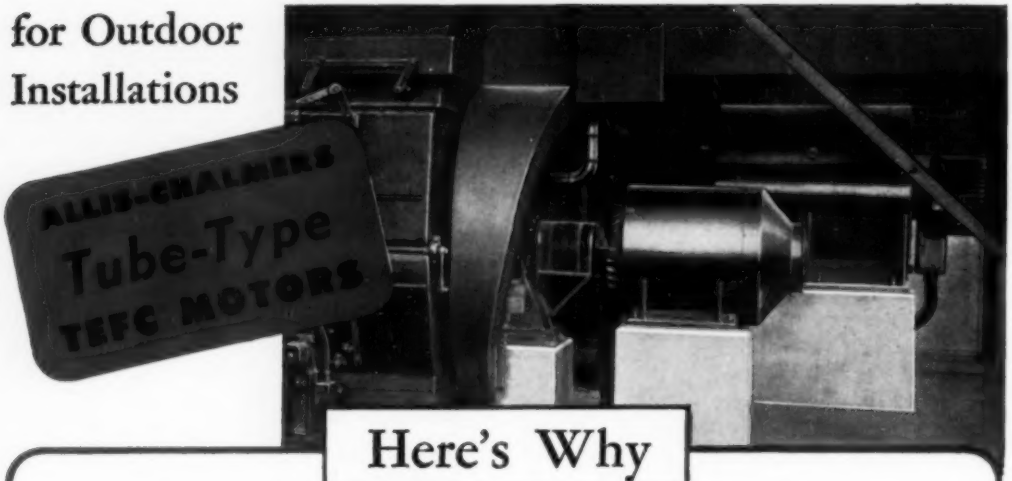
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Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

Manufacturer of: pipe fittings • welding fittings • forged steel flanges • steel nipples • engineered pipe hangers and supports
Thermolier unit heaters • Grinnell-Saunders diaphragm valves • prefabricated piping • Grinnell automatic fire protection systems

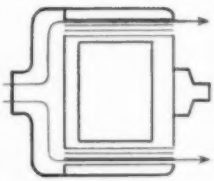
Your *Best* Motor Buy

for Outdoor Installations



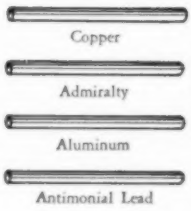
Here's Why

Practically Self-Cleaning



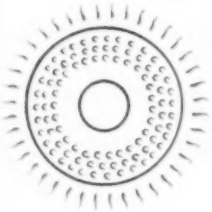
Air-to-air heat exchanger has straight, smooth tubes with no pockets in which dirt or moisture can collect. Velocity of cooling air through the tubes keeps surfaces swept clean. If sticky dirt should pile up, the tubes can be cleaned in a few seconds with a long handled brush.

Choice of Tube Materials



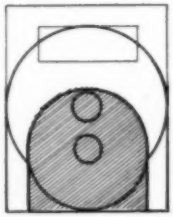
Allis-Chalmers tube-type motors can be built for service in corrosive atmospheres and for outdoor operation in almost any climate. Tubes may be made of a variety of materials, depending on service conditions.

Uniform Cooling



Tubes for carrying cooling air are distributed uniformly around the perimeter of the stator and along its full length. Result: heat travels over a short path and the interior is uniformly cooled.

Compact



Allis-Chalmers tube-type motors are little or no larger than open motors of the same rating. Tube-type design exposes large surface area to cooling air in minimum space.

Get Complete Information Now — Ask your Allis-Chalmers district office representative about tube-type, totally-enclosed fan-cooled motors in sizes up to 2000 hp. Or write Allis-Chalmers, Milwaukee 1, Wis., and ask for Bulletin 51B7150.

A-3767

ALLIS-CHALMERS



*THAT'S WHEN THE SOUTHEAST'S LARGEST ELECTRIC FURNACE WENT INTO ACTION AT DIXISTEEL

A new era in Southern steel-making began on May 13, when the first heat of steel was tapped from our new electric furnace—largest in the entire Southeast.

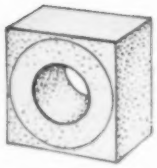
From this new 60-ton-capacity giant will pour more than 100,000 tons of steel annually. This will increase the output of DIXISTEEL by more than 50 percent, bringing the total annual output to more than 300,000 tons.

This means more steel to meet the steadily increasing demands of national defense and civilian requirements.

ATLANTIC STEEL COMPANY • ATLANTA, GEORGIA • MAKERS OF DIXISTEEL SINCE 1901

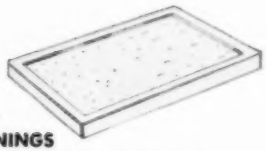
There's no end to the uses of economical

B&W KAOCAST



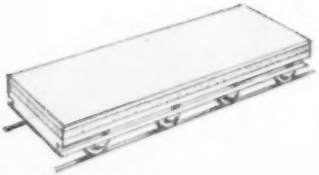
BURNER BLOCKS

Kaocast lasted 3 to 6 times as long as previous refractory. Still going strong.



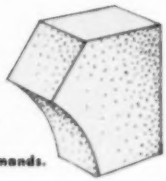
DOOR LININGS

Kaocast lasted 3 to 6 times as long as previous refractory—cut installation cost in half.



TUNNEL KILN CAR TOPS

Ordinary fireclay crumbled after few trips. Kaocast lasted 30 trips without deterioration.



SPECIAL SHAPES

Kaocast special shapes cast over week-end to meet production demands.

BOILER FURNACE REPAIRS

One power plant keeps a ton of Kaocast on hand for miscellaneous repairs because it is so versatile.



The list of plants who are discovering new, cost-saving uses of versatile B&W Kaocast keeps growing all the time. The reasons? This unique 3000 degree refractory castable can be molded in a hurry . . . cast directly in place . . . applied with a cement gun. It eliminates the need for a large inventory of special shapes. It has high resistance to spalling, low volume change, practically no reheat shrinkage. Want to know more? Ask your B&W Refractories Engineer—or write for Bulletin R-22.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.

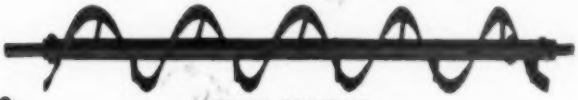
R-454

B&W REFRACTORIES PRODUCTS—B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS—Stationary & Marine Boilers and Component Equipment . . . Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers . . . Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

Continental SCREW CONVEYORS



HELICOID AND SECTIONAL FLIGHT SCREW CONVEYOR



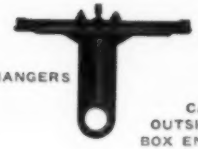
RIBBON CONVEYOR



FABRICATED STEEL BOX END WITH CONTINENTAL SKF PILLOW BLOCK, AND SPLIT DUST SEAL GLAND



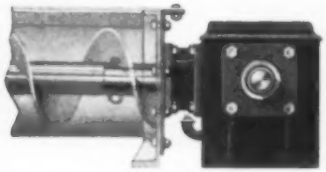
COUPLINGS



HANGERS



CAST IRON OUTSIDE PATTERN BOX END WITH FEET

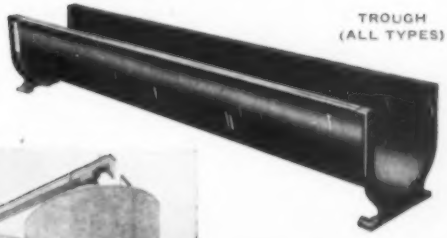


ENCLOSED COUNTERSHAFT BOX ENDS

Continental Screw Conveyors are manufactured in all types, and are favorably known throughout the trade. Standard Parts can be shipped from stock.

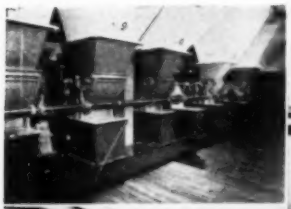
When complete installations are required consult Continental Engineers. We also manufacture conveyors for special applications.

Send us your orders.



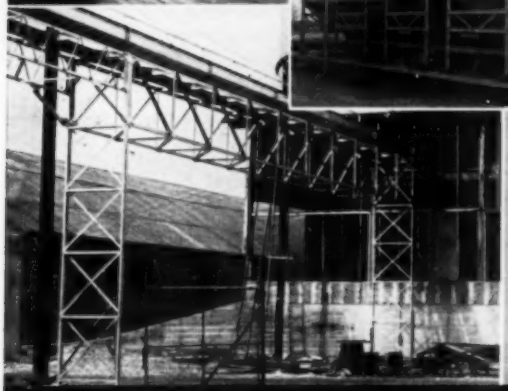
TROUGH (ALL TYPES)

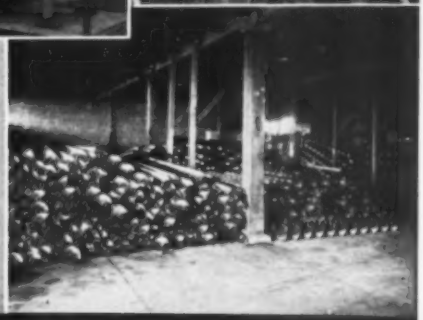
CG-5006











Industrial Division CONTINENTAL GIN COMPANY Birmingham, Alabama

NAVCO "Universal" PIPE SUPPORTS



Vertical adjustment up to 2½ inches can be made.

Support may be turned to any angle of 360°.

Will take care of 8 inches of travel.

Features

Universal Pipe Supports hold the pipe down as well as up. They prevent pipe from getting out of alignment, which is usual when Roller Supports are used.

They permit control of expansion movement and insure the desired free action of Slip Expansion Joints so essential in tunnel and duct work.

Expansion movement of pipe will not disturb the insulation.

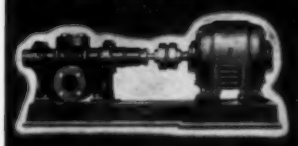
Made in Cast Iron or Steel and provided with forced lubrication for lines exposed to the weather.

NAVCO

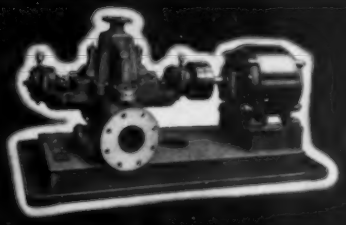
NAVCO PIPING

NATIONAL VALVE & MANUFACTURING COMPANY • PITTSBURGH, PA.

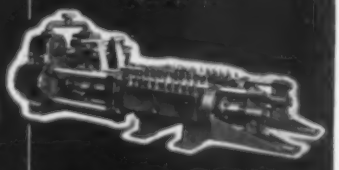
NEW YORK • CHICAGO • CLEVELAND • BOSTON • ATLANTA • TULSA • BUFFALO • CINCINNATI



Warren-Quimby Gear-in head Screw Pump



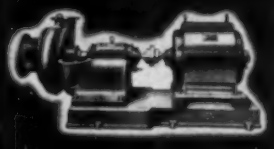
Warren Condensate Pump



Warren Horizontal Duplex Hydraulic Pump

WARREN PUMPS

Maintain efficiency • Operate at low cost • Are long-lived



Warren Type "L" Single-Stage Single-Suction Liquor Pump

CENTRIFUGAL

Single and Multi-stage
Pressure range: Up to 1200 P. S. I.
Capacities: Up to 50,000 G. P. M.
Types: Horizontal and Vertical
Impellers: Open or Enclosed

RECIPROCATING

Horizontal and Vertical Single Piston
Horizontal and Vertical Duplex Piston
Single and Duplex Outside Packed Plunger
Single, Duplex and Compound Hydraulic
Steam Heat Vacuum
Automatic Pump and Receiver, etc., etc.,

WARREN-QUIMBY SCREW PUMPS

Gear-in-head and External Gear and Bearing
Capacities: Up to 3000 G. P. M.
Pressures: Up to 200 P. S. I. on low viscosity liquids; practically unlimited on high viscosity liquids
Horizontal or Vertical Mounting

WARREN-QUIMBY ROTARY PUMPS

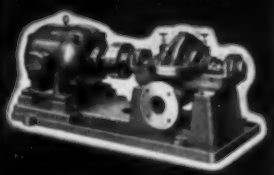
Gear-in-head and External Gear and Bearing
Capacities: Up to 1000 G. P. M.
Pressures: Up to 250 P. S. I.
Horizontal or Vertical Mounted

Send your pumping problem to us, Warren Engineers will recommend the right pump for the job.

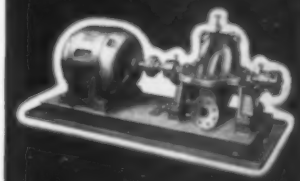
P-28



Warren-Quimby External Gear and Bearing Rotex Pump



Warren Type DBL, Single-Stage Double Suction, Centrifugal Pump

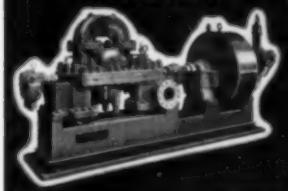


Warren Two-Stage Volute Centrifugal Pump

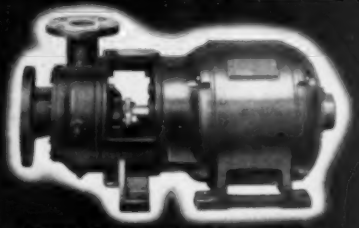
WARREN QUIMBY PUMPS

WARREN STEAM PUMP COMPANY, INC.

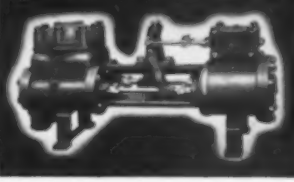
WARREN, MASSACHUSETTS



Warren 4- and 6-Stage Centrifugal Pumps



Warren "Compacunit"—4 Types—42 Sizes



Warren Horizontal "Realwear" Duplex Piston Pump

What has caused this tremendous SWING to Riley Traveling Grate Spreader Stokers?

As more and more Riley Traveling Grate Spreader Stokers have been placed in operation Riley Spreader Stokers are being selected by greater and greater numbers of the country's leading public utility and industrial plants—to such an extent that to date in 1952, Riley has sold more traveling grate spreader stokers than all other companies combined.

We believe the fundamental reason for this tremendous swing to Riley is that news of the excellent results and satisfactory performance of Riley Spreader Stokers has traveled rapidly from plant to plant. Such satisfactory performance is largely due to design characteristics and the vast experience of Riley in the stoker field.





THE GRATE SURFACE The grate surface is made up of small clips, two inches wide by six inch pitch, mounted on structural T bars. The use of small grate clips eliminates warping and cracking and assures low maintenance and long life by providing adequate cooling. Clips are of nickel-chrome alloy to minimize growth. A level grate surface and uniform air distribution results.



THE FEEDER-DISTRIBUTOR The feeder is designed to give uniform positive feed regardless of coal characteristics and moisture. Avalanching with fine coal does not occur. The overthrowing distributor gives uniform longitudinal and lateral distribution and prevents damage and outage caused by wedging of foreign materials between distributor and housing.

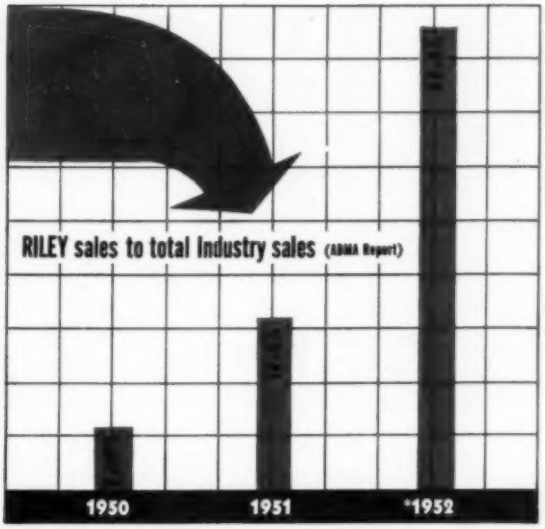
TRADE MARK Rx REGISTERED

RILEY

STOKER CORPORATION, WORCESTER, MASS.

Boston · New York · Philadelphia · Washington · Buffalo · Pittsburgh · Cleveland · Detroit · Chicago
Cincinnati · Charlotte · Atlanta · New Orleans · St. Louis · Kansas City · St. Paul · Tulsa · Houston
Denver · Salt Lake City · Los Angeles · Portland · Seattle

BOILERS · PULVERIZERS · BURNERS · STOKERS · SUPERHEATERS · ECONOMIZERS



* First three months, latest available figures at time of ad preparation.



THE GRATE DRIVE The Riley grate drive is a hydraulically driven ratchet drive, completely enclosed and automatically lubricated. This simple rugged drive operates with practically no maintenance and is not susceptible to damage in case of grate obstruction. No sprockets, chains or speed reducers are required.

BACKED BY OVER 50 YEARS OF EXPERIENCE There are over 50 years of stoker designing and manufacturing experience back of the Riley Traveling Grate Spreader Stoker, dating back to the two first successful makes of stoker—the Murphy Furnace and the Jones Underfeed Stoker. Riley has been manufacturing traveling grate stokers for over thirty years.

We believe it will pay you to visit some installations before purchasing traveling grate spreader stokers.

All of these Companies have ordered Riley Traveling Grate Spreader Stokers

CARBIDE & CARBON CHEMICAL COMPANY
Whiting, Indiana

OHIO EDISON COMPANY
Springfield, Ohio—two orders

IOWA-ILLINOIS GAS & ELECTRIC COMPANY
Iowa City, Iowa

CELANESE CORP. OF AMERICA
Hopewell, Virginia

CLIFFS POWER & LIGHT COMPANY
Ishpeming, Michigan

IOWA PUBLIC SERVICE COMPANY
Carroll, Iowa

KENNECOTT COPPER COMPANY
McGill, Nevada

GENERAL ELECTRIC COMPANY
Richland, Washington

GARLOCK PACKING COMPANY
Palmyra, New York

SWIFT & COMPANY
Baltimore, Maryland

E. I. DUPONT DE NEMOURS & CO.
Savannah River Project, South Carolina

KAISER-FRAZER COMPANY
Willow Run, Michigan

B. F. GOODRICH COMPANY
Akron, Ohio

UTAH-IDAHO SUGAR COMPANY
Washington

ARMSTRONG CORK COMPANY
Lancaster, Pennsylvania

PENNSYLVANIA ELECTRIC COMPANY
Seward, Pennsylvania—three orders

OHIO EDISON COMPANY
Youngstown, Ohio

OTTERTAIL POWER COMPANY
Crookston, Minnesota

CHAMPION PAPER & FIBRE COMPANY
Canton, North Carolina

CENTRAL ILLINOIS LIGHT COMPANY
Springfield, Illinois

MONSANTO CHEMICAL COMPANY
Springfield, Massachusetts

GENERAL ELECTRIC COMPANY
Louisville, Kentucky

GAYLORD CONTAINER COMPANY
Bogalusa, Louisiana

JOHN DEERE & COMPANY
Alladin, Iowa

SWIFT & COMPANY
Charlotte, North Carolina

BROWN-LIPE-CHAPIN DIV.
GENERAL MOTORS COMPANY
Elyria, Ohio

U. S. GYPSUM COMPANY
Oakfield, New York

STOKELY FOODS
Indianapolis, Indiana

CATALYTIC CONSTRUCTION COMPANY
Fernald Project, Ohio

SANGAMO ELECTRIC COMPANY
Springfield, Ohio

UNIVERSITY OF MINNESOTA
Minneapolis, Minnesota

ROCHESTER MUNICIPAL PLANT
Rochester, Minnesota

CITY OF NAPOLEON
Napoleon, Ohio

CORN BELT POWER CO-OP.
Humboldt, Iowa

U. S. AIR FORCE BASE
Limestone, Maine

CITY OF AMES
Ames, Iowa

ALABAMA ELECTRIC CO-OP.
Andalusa, Alabama

JAMIESON COAL & COKE CO.
Farmington, West Virginia

SPOKANE WATER WORKS
Spokane, Washington

A survey of your Power Plant by a consulting engineer will possibly show ways of making surprisingly large savings in your power costs

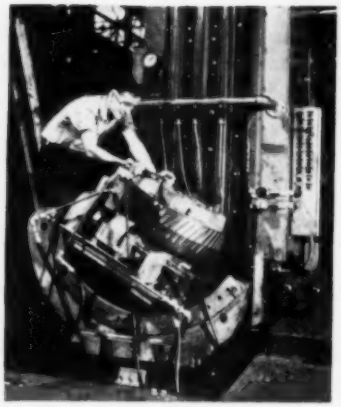
COMPLETE STEAM GENERATING UNITS

. . . it will pay you to visit modern Riley Installations before purchasing Boiler or Fuel Burning Equipment

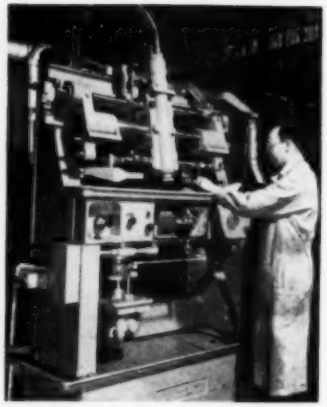
WATER-COOLED FURNACES • STEEL-CLAD INSULATED SETTINGS • AIR HEATERS



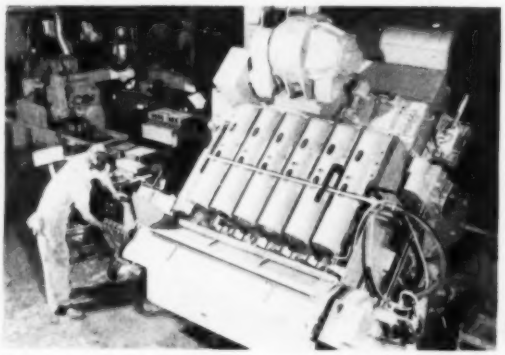
This accuracy check on turbine bucket dovetails is one of many quality controls.



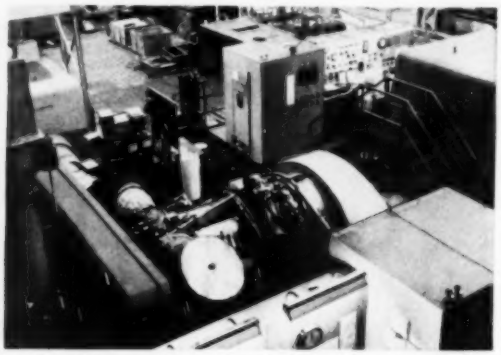
Automatically operated, this three-station broach cuts dovetails in compressor wheels.



An automatic polisher brings machined compressor blades to their final contour.



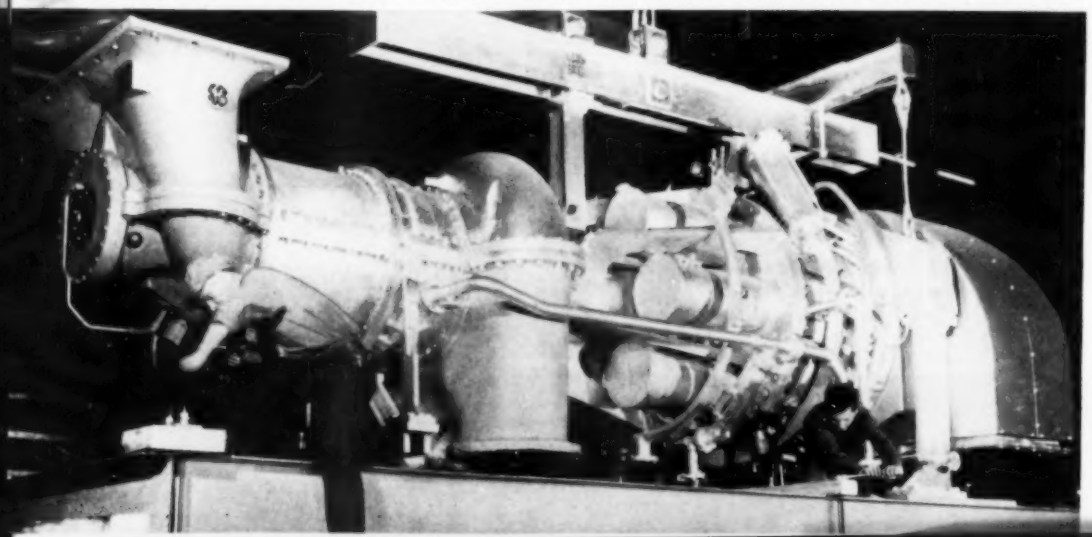
This machine simultaneously cuts six compressor blades or turbine buckets from blank stock to within 0.005 in. of finished dimension.



Testing includes checking of mechanical balance, performance, bearing operation and emergency and speed regulating governors.

General Electric's Gas Turbine Plant

ASSEMBLED UNITS LEAVING THE FACTORY ARE READY FOR PERMANENT INSTALLATION WITH A MINIMUM EXPENDITURE OF TIME AND LABOR.





One of the bays in General Electric's gas turbine plant at Schenectady, N. Y. Units are being assembled for locomotive, pipeline pumping, and power generation service.

Now Tooled for Continuous Production

With the recent addition of a number of specialized machine tools, General Electric's gas turbine manufacturing facilities are virtually complete. Production, testing, and shipment are on a regular schedule in the Schenectady, N. Y., plant. In fact, the 1952 order board calls for delivery of 46 units—six for freight locomotives, 34 for natural gas pumping stations, and six for power generation service in electric utilities. An even larger total will be produced in 1953.

Components for the 3500 kw simple-cycle, the 3500 kw regenerative-cycle, and the 5000 kw compound-cycle designs are in continuous production.

Recently, the first regenerative-cycle machine completed factory tests and is now being installed. This design, distinctive for its flexibility, is suitable for utility application in a variety of arrangements involving the combined use of both gas and steam turbine cycles.

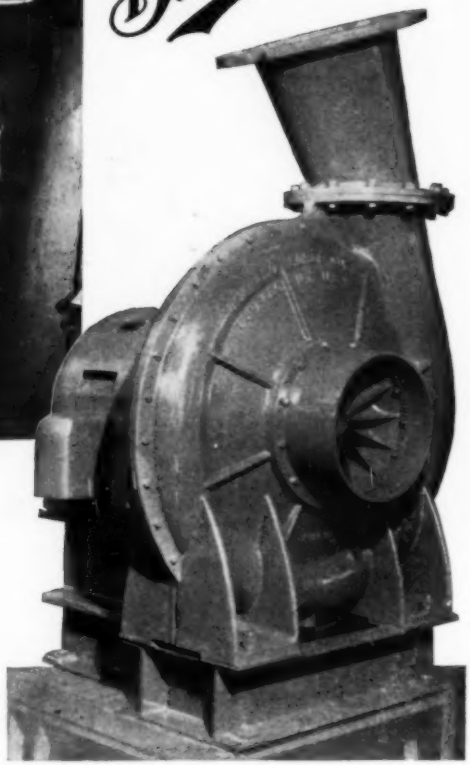
Of particular importance are the refinements in manufacturing procedures which have come about as the result of operating experience with half a dozen units in customer installations. A large fund of data on fuels, design details, and performance has been accumulated.

Thus, in less than five years, a completely new development has become an established product. America's newest prime mover is making a significant contribution to the nation's over-all program for power expansion. General Electric Company, Schenectady 5, N. Y. 253-6

GENERAL ELECTRIC

New KAISER ALUMINUM Plant USES 224 "Buffalo" FANS





FOR DIESEL SCAVENGING

Eighty of these extremely compact high pressure "Buffalo" Blowers supply scavenging air to the radial Diesels in the giant new Kaiser Aluminum plant at Chalmette, Louisiana.

FOR EXHAUST —

Sixty-four 100-inch "Buffalo" MW Exhausters serve on pot line exhaust at the new plant. Powered by 75 h.p., 1200 rpm motors, they have heavy plate housings and wheels to resist abrasion.

FOR FRESH AIR SUPPLY —

Eighty 54-inch "Buffalo" Tubaxial Fans supply fresh air quietly and efficiently. These fans require a minimum of space, and have cast aluminum wheels.

BUILT FOR HIGH PRESSURES!

Heavy, ribbed cast iron housings and welded steel wheels mean efficient performance at high air velocities and pressures, in "Buffalo" Scavenging Blowers.

Send Your AIR PROBLEM TO "BUFFALO"!

Hundreds of business leaders like Kaiser Aluminum are relying on "Buffalo" Fans and Air Conditioning Units for plant-wide comfort, and the 1001 other jobs air does for industry. What is your air problem? There's a "Buffalo" Fan to solve it. Let us mail you details.

"Buffalo" FIRST FOR FANS

BUFFALO FORGE COMPANY

530 BROADWAY BUFFALO, NEW YORK

PUBLISHERS OF "FAN ENGINEERING" HANDBOOK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont. Sales Representatives in all Principal Cities

DIAMOND JUBILEE 75TH ANNIVERSARY

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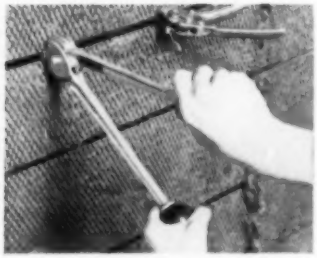
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These are efficient insulating blocks manufactured from Eagle-Picher High Temperature Mineral Wool. They derive low thermal conductivity, high refractory value, and outstanding chemical and physical stability from this basic insulating material. Weight is approx. 22 to 24 lbs. per cu. ft. Designed for temperatures up to 1700 F.



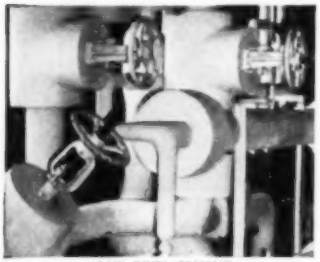
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The answer to the problem of quickly and efficiently insulating flat or curved surfaces on larger types of heated equipment. Factory-made, these blankets are certified to meet rigid high standard specifications, offer unexcelled uniformity of mineral wool distribution. Withstand continuous exposure to temperatures as high as 1200 F. . . . offer maximum water repellence . . . resistance to steam, corrosive fumes, normal vibration.



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A rust-inhibitive, super-adhesive insulating cement . . . offers exceptional coverage, extreme thermal efficiency. "Springy ball" structure—with small resilient pellets, each containing thousands of "dead" air cells—provides one of the most effective heat barriers known. Easily trowelled over all kinds of surfaces. Efficient up to 1800 F. . . . reclaimable where temperatures don't exceed 1200 F. Can be applied to any heated equipment.



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One-Cote provides both insulation and a smooth off-white finish coat. Unexcelled for coverage —100 lbs. covers approx. 40 sq. ft. one inch thick—Eagle-Picher One-Cote Cement is of uniformly high quality . . . quick setting, easy to handle . . . can be painted. This self-protected insulation withstands temperatures up to 1000 F.

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GENERAL OFFICES: CINCINNATI (1), OHIO

Insulation products of efficient mineral wool—for a full range of high and low temperatures. Technical data on request.



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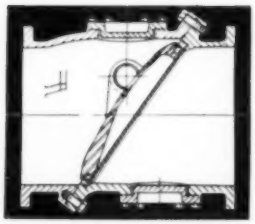


the TILTING DISC in CHAPMAN'S CHECK VALVE

Yes, this is on the level . . . Chapman's Tilting Disc design offers you savings in head loss 65% to 85% over regular swing-type check valves.

For this Tilting Disc rides the flow . . . cushions itself to a quick, *quiet* closure right at the instant when there's no velocity in the line. There's no slamming, under usual pipeline arrangements. So there's no jarring of the line, no opening of the joints, no wear of moving parts worth mentioning. And seating is *drop-tight.*

Certified engineering test-results are charted in Catalog No. 30. Take a look at these tests . . . and then figure what Chapman Tilting Disc Check Valves can save for *you.* Send for your copy now.



Cross-section of the Chapman Tilting-Disc Check Valve. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

THE CHAPMAN VALVE MFG. CO., INDIAN ORCHARD, MASSACHUSETTS

Timely Comments

Industrial Applications of Oxidizing Catalytic Unit Appear Unlimited

IN 1949, EUGENE J. HOUDRY, famed catalytic scientist and inventor, developed an oxidizing catalyst to burn carbon monoxide given off by engines using unleaded gasoline and convert it into harmless carbon dioxide. It was for use on industrial trucks, those used in materials handling in factories. About 1000 installations have been made on industrial trucks, each containing from two to twelve catalytic units depending on the size of the engine. Several trial installations have also been made on diesel engines.

A catalyst is a chemical which reacts continuously with products to be transformed. After the reaction is completed, the catalyst reverts to its original state. That is Houdry's theory — that the catalytic material actually takes part in the reaction, repeatedly entering and leaving it, rather than being a non-participant encouraging the reaction merely by its presence.

This same oxidizing catalyst is now destroying harmful and unpleasant industrial odors and burning them up completely. At the same time, by a more efficient combustion and recovery of heat from hitherto waste products, it is **cutting consumption of fuel** almost unbelievably.

First industrial installation of the Houdry catalyst was completed late in March of this year at the Enamelstrip Corporation Plant in Allentown, Pa. Here metals are coated with enamel in a continuous operation. Batteries of the catalytic units have been installed in each of the stacks venting fumes driven off from the enamel solvents in the company's four baking ovens.

The company's plant engineer reports that the results have been amazing. "There are absolutely no odors. We're burning the fumes in the catalysts and getting so much heat out of them we're heating the ovens with it most of the time and throwing a lot more of it away. We plan to heat the plant with part of the excess."

The ovens hitherto were heated by gas exclusively. But now the heat recovery through the catalysts has allowed the company to so reduce consumption of gas that they are saving 90 per cent of gas costs. Savings average about $3000 per month. The installation cost $16,000, of which $13,000 was for the catalytic units. The installation will pay for itself in six months. The company has been able to increase production more than 40 per cent because there is so much heat available.

In the Enamelstrip operation, gas burners are turned on initially to raise the temperature in the oven to the required degree. As enamel is baked dry on a moving sheet of metal, solvent fumes exhausted into a stack by a fan pass over the catalytic elements. Heat thus generated in the catalysts is brought back into the oven. Gas burners are turned off and the operation goes on by itself. Fumes are turned into heat which, back in the oven, drives off more fumes to be turned into heat which, back in the oven . . .

INSTALLATION—Catalytic units are set in layers, much like building blocks, in the venting stack. Unit is made up of two thick porcelain end plates, a spacer bar of porcelain and 73 coated porcelain rods. End plates are joined rigidly at their centers by the spacer bar after the rods have been inserted at both ends into shallow sockets in the plates. There is some play in the rods to allow for expansion and contraction during temperature change.

Vital part of the unit is the coating, only .003 of an inch thick, on the rods. This is a film of catalytic alumina and platinum alloy applied by a special process in such a way that it remains adherent, intact, and resists high temperatures and thermal shocks. Each unit is 5½ in. long, 3⅛ in. high and 3 in. wide, and a total of 918 such units are used in the enameling plant installation.

The Houdry catalysts are being manufactured by the Oxy-Catalyst Manufacturing Company, Inc. of Wayne, Pa. Installations are being put in, engineered or in the planning stage for half a dozen other companies, including a large printing firm, a dyeing company and an oil refiner. The industrial applications appear unlimited. The catalytic unit converts fuel and hitherto waste products into heat with unmatched efficiency, and destroys noxious and harmful industrial odors which plague workers and residents in manufacturing centers.

NO REPAIRS IN 11 YEARS OF CONTINUOUS SERVICE



STERLING SLO-SPEED!

A Sterling Slo-Speed has been running continuously since its installation eleven years ago on our dry cement conveyor... it has handled an average of one hundred tons of cement per day... it has never been removed from its base for repairs... and, it is still running as well as it did when new. For dependable, trouble-free service, we recommend Slo-Speeds to anyone, reports James Gann, Vice-President in Charge of Operations, John B. Lagarde, Inc., Anniston, Ala.

STERLING SLO-SPEED GIVES YOU THE ONE BEST LOW SPEED AND

gives uninterrupted service—carries heavy overhung loads—provides versatile mounting and flexibility in arrangement of machinery—saves valuable space—provides greater safety—costs less to install and use. An indispensable source of low speed power for:

Agitators	**Dryers**	**Presses**
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70 ILLUSTRATIONS showing how Sterling Electric Power Drives reduce production costs. Write for Bulletin No. D-117.



OUTSTANDING FEATURES:
Simplified gear system—balanced design—compact—rugged—highly efficient—abundant lubrication—low output shaft—positive oil seals—Herringbone Rotor—protected—streamlined—direct through ventilation—quiet operation—AGMA speeds—extremely long life—every unit will operate in any position.

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Plants: New York City 51; Van Wert, Ohio; Los Angeles 22; Hamilton, Canada; Santiago, Chile.
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Industry Speaks

SOUTHERN POWER AND INDUSTRY

OPERATING BRIEFS from the Southern Gas Association's Galveston, Texas, Meeting

Gas and Gas Diesel Operation

Adapted from comments by *E. L. Miller* of the *Cooper-Bessemer Corporation* before the industrial sales forum.

THE ULTIMATE hasn't been reached in making the most efficient gas and gas diesel engines. In presenting an illustrated resume of current developments in gas-operated power sources for industrial applications, Mr. Miller described the strides made toward perfecting the 4-cycle gas engine. Developments that have just been completed are effecting greater economies in gas-burning equipment, while others that are still in our engineering research laboratories are showing great promise for commercial installations.

One such development described is a patented Cooper-Bessemer system of conditioning combustion air. Most of us have noticed how much better our automobile engine runs on a cool damp evening. This isn't our imagination, since tests have proved that an engine will run much smoother and develop more power when the combustion air is cool and moist. Mr. Miller emphasized that the new Cooper-Bessemer system gives the following advantages: Permits increased engine ratings; lowers specific fuel consumption; improves combustion characteristics by more orderly flame propagation, thus reducing noise, lowers heat load on all cylinder parts; and eliminates the necessity for deaeration of engines for high ambient temperatures.

Safest Place Is at Your Job

Adapted from comments by *W. H. Adams*, safety consultant for the *American Gas Association*, before the employee relations section.

WHEN YOU CONSIDER that the normal factory, mill or plant is potentially dangerous to life and limb, and when you also consider that a man walking down the street is potentially safe, then you can get a proper perspective on your accomplishments. Safety engineers have made industrial workers nearly five times as safe in their potentially dangerous jobs as what ordinary people consider safe. In other words, they are safer than safe.

In 1951, about 77,000 persons were killed while away from their jobs, but only 16,000 lost their lives at work. He compared this record with that of 1920 when for a comparable number of jobs there would have been 75,000 fatal accidents. So safety engineers must be credited with saving the lives of 59,000 workmen in 1951 alone.

Managing People—Big Problem

Adapted from comments by *L. L. Dyer*, comptroller of the *Lone Star Gas Company*, Dallas, Texas, before the opening general sessions.

A NEW BIG PROBLEM of industry is how to manage people. A hated boss is an ambassador for communism; a sympathetic boss is a priceless asset of democracy. The former can do more to destroy the democratic concepts of our people than a truckload of Stalins. A boss who understands the fundamental inspiration of our way of life is worth more to our democracy than all the patriotic orations in the world.

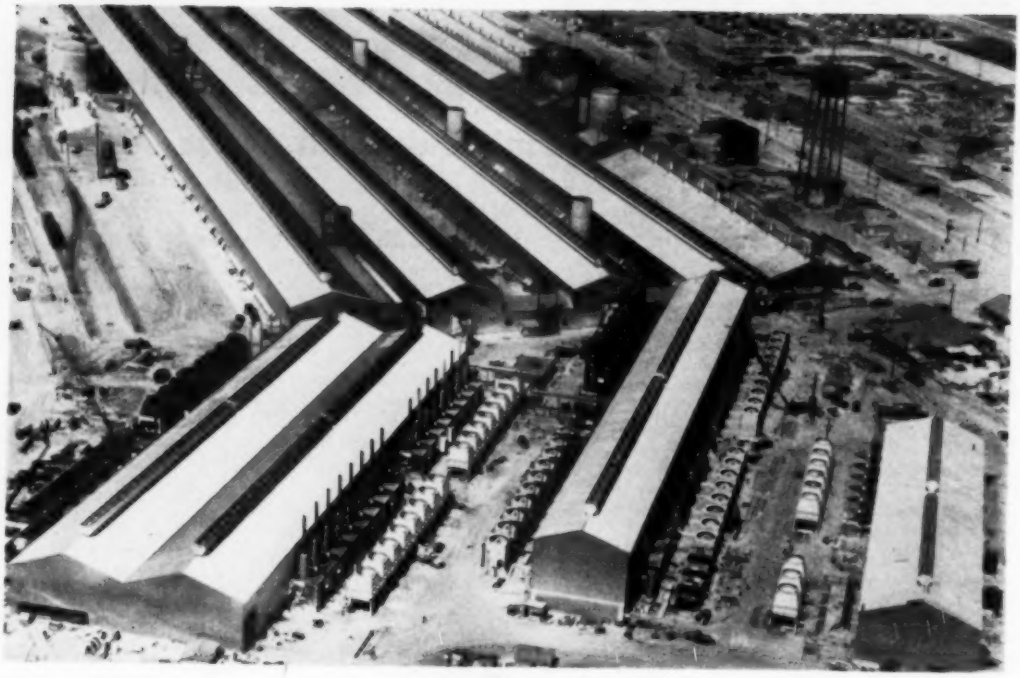
There are three major areas of employee dissatisfaction: (1) They do not have proper information about their company, their country, our economic system, and the relationship of their job to the entire economy. (2) They are frustrated; they want respect and place; they want to feel they are necessary in the work of their company. (3) In too many companies, there is no machinery for permitting the employee to pour out his problems. Unsatisfied employees cannot make satisfied customers.

A company is nothing more than these individual people. They must be informed; their best talents and skills must be employed, they must know that they occupy a necessary place in their company and community; and they must have a feeling of growth and progress. This is the only way they can take their proper place in society and give testimony to the benefits of free enterprise and build good customer relations in their particular locality.

Personnel departments should be something more than employment offices. They should be human relations departments and realize that they have a responsibility in developing employees to be full-time representatives of the company and community. Set up a program for the education of your employees in American citizenship. Such a program should develop self-confidence, everyday use of human relations, enthusiasm and effective communication with your customers. This sort of training should expand individual thought by your employees and their families and guide them into a perpetual usage of the principles of living, according to the precepts of Christianity.

The 44th Annual Convention of the *Southern Gas Association*, held in Galveston, Texas, April 28-30th, is reported in the News section of this issue. *Mr. J. H. Wimberly* of the Houston Natural Gas Corporation, is the newly elected president. The next annual convention will be held in New Orleans, May 11-13, 1953.

Reynolds' New Texas Aluminum Reduction



83 Gas Engines . . 185000 KW

ONE of the largest electric generating plants of its kind is being installed in Reynolds Metals Company's immense new aluminum reduction plant near Corpus Christi, Texas.

Here, under one roof, 33 Cooper-Bessemer engines, fueled by natural gas, are already in operation generating electric power for one of the two aluminum pot lines. Each engine drives a 2500 kw d-c generator.

In an adjoining building, another group of engine-generator sets is being installed to supply electricity for the other aluminum pot line. Here are 41 General Motors gas-burning diesels of a new type. Each engine has 16 cylinders, arranged like two V-eights, V-to-V, stood on end. The vertical shafts of these engines extend down through the floor to drive forty-one 2000 kw d-c generators located on the ground floor below the engine room.

Although these huge engines run on natural gas, they are supercharged like aircraft engines, a unique and relatively recent development, affording record breaking fuel economy and much more power in the same amount of space.

In addition to these two enormous power houses there is a similar plant that generates alternating current for the operation of all electrically driven machinery, equipment and lights throughout the plant buildings. In this second power plant are nine additional Cooper-Bessemer 16-cylinder supercharged gas engines, identical to those in the 33-unit plant. These are now in operation.

Total output of these three tremendous power plants is 185,000 kw . . . enough electricity to supply all the residences in Houston, Dallas, San Antonio and Ft. Worth, Texas.

Fuel Economy

The gas for fueling the engines comes from fields near the site of the plant itself. Engineers estimate that when operations reach full

Plant Now in Operation

PRINCIPAL FEATURES

Reynolds Metals Company's new San Patricio Aluminum Reduction Plant, near Corpus Christi, Texas, is an $80,000,000 installation which represents significant advances in the science of aluminum production. This plant will make 160,000,000 pounds of aluminum annually, and contains four huge pot rooms nearly a third of a mile long.

The buildings contain approximately 1,000,000 sq ft of floor space and are located on a 160-acre plant site in San Patricio County, Texas, some 14 miles north and east of Corpus Christi, Texas.

It is to be expected that this plant will arouse a great deal of interest and attention, because of the number of new ideas it incorporates, and because of the size of the project. Among its outstanding points are these:

1. This plant contains the two largest individual aluminum reduction pot lines in the country. Each of these lines has at present a capacity of 105,000 amperes. The direct current generating buildings are the two largest internal combustion engine-generator buildings known in the world.

2. This Reynolds Metals Plant represents the first application of the highly efficient, smooth running, turbocharged four-cycle gas engines to aluminum reduction pot lines.

3. This plant is the first aluminum reduction pot line plant having integrated alternating current and direct current generating power plants, independent of outside power.

capacity, power generation will consume over 48,000,000 cu ft of gas a day. By contrast, were the same amount of fuel energy to be supplied with diesel oil, it would take 41 tank cars a day. If coal were used, a train of 83 cars would have to draw up to the siding every 24 hours.

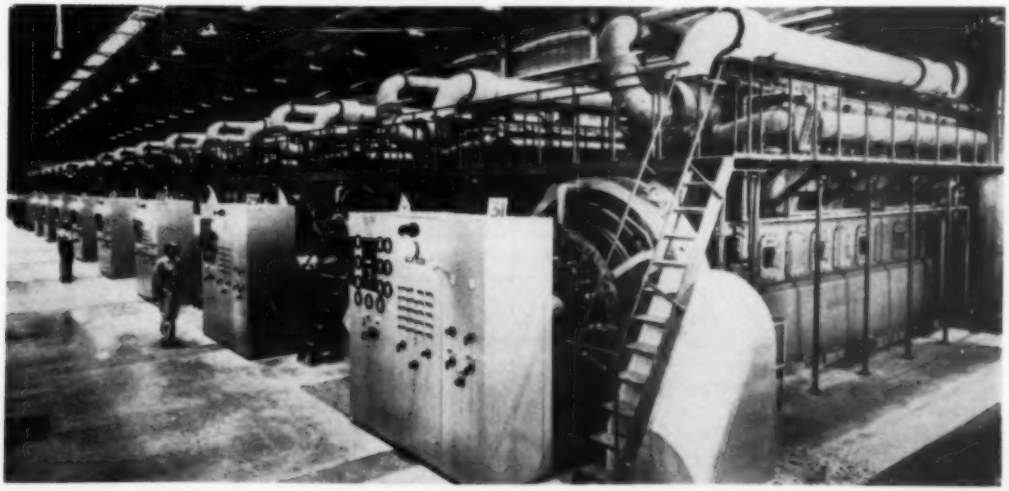
As immense as this fuel consumption sounds, it is nevertheless a highly economical operation and every effort has been concentrated on conserving gas. The new type supercharged engines are able to produce electric power with appreciably less gas than is ordinarily required.

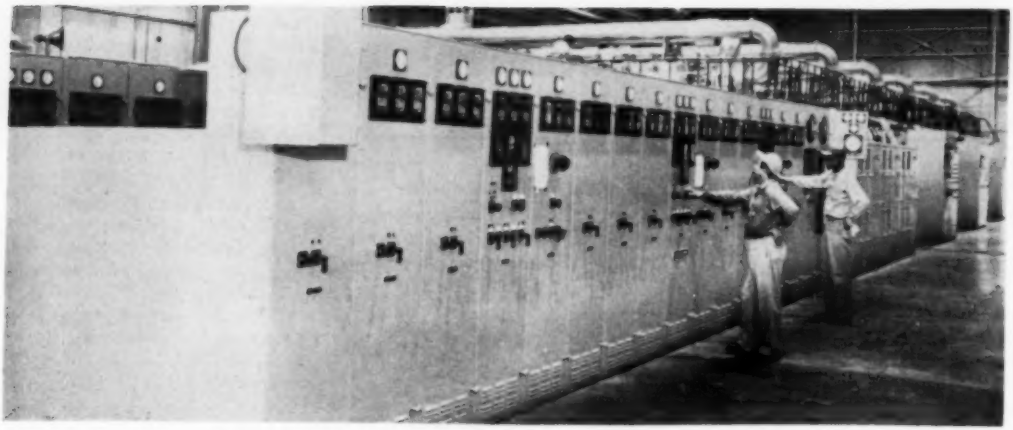
According to power engineers, this fuel economy is a major factor in enabling the company to produce electric power at a lower cost than other power plants in the United States, even including the large steam turbines.

Automatic Operation

In the production of aluminum, continuous operation of all equipment on a round-the-clock basis is an absolute essential. Any extended power failure would be extremely costly, since the molten metal would freeze in the pots, involving a half million dollar cost for relining and recharging the pots. In addition, this work would take 3 to 4 weeks' time. Thus, before pot line operation could be resumed, 3-4 weeks'

Shown here are 16 of the 31 Cooper-Bessemer engines in the newest plant of Reynolds Metals Company.





Central control board for all engines in the alternating current power plant.

output of aluminum would be lost.

Consequently, the design of the electric generating system keynotes many new and unique advances in automatic engine and station controls, each carefully interlocked to guard against every possible contingency. Details have been worked out to so fine a degree that the 33-engine plant is kept running with only four technicians on the job. Assisting them are the most modern electrical devices to warn of virtually any conditions that might lead to trouble. In the event of such warnings, standby engines can be started immediately and switched onto the main bus line.

Continuous and efficient operation is further assured as the result of an unusual training program for the men who supervise the engines. These men were thoroughly schooled in every detail of engine operation and behavior, both at the Reynolds plant by leading engineers on various phases of engine care and at the engine makers' plants.

Independent Unit

Unlike many other aluminum reduction plants, San Patricio is not dependent upon outside electric power for its operation. Its own generating facilities include forty-one 3000 hp engines, and forty-two 3700 hp engines—a total of 278,400 horsepower.

These plants with their row upon row of giant engines make a truly impressive sight.

General Motors Engines

In Building No. 42, there are 41 General Motors Model 16-358X engines in two rows. These are mounted on the second floor and drive generators in a room below through vertical shafts. Each engine is rated 3000 hp at 600 rpm.

These are 16-cylinder radial type units, consisting of four banks one above another, four cylinders in each bank. When you first see them, they look like two V-Eights turned on end and mounted V-to-V. This is the first application of this type engine and represents the first four-bank design of gas-burning diesel engine put into practical use.

These units use full spark ignition to burn straight gas. Each unit is started electrically by supplying current to the generator and running it as a motor.

All these engines have separate centrifugal type superchargers which are not mounted on the engines. They are supplied with intake air filters. No air cooler is required with these units. Each of these engines drives a General Electric Company 2000-kw, 720-volt, d-c generator direct connected to the engine.

Cooper-Bessemer Engines

There are a total of 42 Cooper-Bessemer Type LSV-16, each rated 3700 hp at 327 rpm. Thirty-three of them are in Building No. 41 direct connected to General Electric Company 2500-kw, 720-volt d-c generators. Then there are nine more of these engines driving General Electric Company 2500-kw, 4160-volt, 3-phase, 60-cycle, a-c generators in Building No. 40, known as the "AC" building.

All these Cooper-Bessemer engines employ a twin ignition system, and burn straight gas. They are started by supplying compressed air at 250 psi pressure to certain cylinders.

These units have superchargers with the unit mounted on the engine. They also use an air cooler to pre-cool intake air. Air filters are the full-flow type through cartridges, using detergent oil.

Each Cooper-Bessemer and each General Motors engine has its own self-contained water cooling system, and its own oil cooling system. Young radiators are mounted outside the buildings and fitted with individual automatic controls. Filters for engine intake and building air are oil bath type supplied by American Air Filter Co.

Also in the "AC" building is a Le Roi Model 300 AL-3460 emergency unit for starting up the alternating current plant. This engine drives a 300 kw, 480-volt, 3-phase, 60-cycle generator.

Heat Transfer Equipment

Young Radiator Company supplied the entire assembly to cool the 83 engines: lube oil cooling coils, jacket water cooling coils, water manifolds, fans, fan shrouds, fan support tripods, fan shafts, fan

shaft bearings and couplings, and gear boxes.

Coils, made of heavy-wall round tubes, are rolled into thick header plates. The oil cooling coils have patented internal Young turbulating-type agitators for maximum efficiency. All units are designed for operation at 100 psig, all coils are tested at 200 psig. Both copper and aluminum coolant carrying tubes are used. Fin plates or secondary surface is aluminum throughout.

For the Cooper-Bessemer engines, horizontal cores were used. Each unit has two water cooling coils, one pass, with $\frac{5}{8}$ in. O.D. x .035 tubes rolled into the steel tank, and aluminum fins. Water and oil tanks are of fabricated steel. The finned face dimensions of the water coils are 72 in. x 180 in. Water coil manifolds connect the two water coils in series.

Each unit also has one single-pass oil cooling coil. They utilize $\frac{3}{4}$ in. O.D. x .035 tubes, aluminum fins, and patented Young turbulating-type agitators inside the tubes.

Each plenum chamber has a battery of electric space heaters, each developing 4 kw, to prevent freezing when the unit is not operating.

Thermostats control electrically-operated shutters, which are interlocked with the fan motor starter. The shutters over the oil coils and those over the water coils are controlled separately from individual thermostats. The position of the shutters determines whether the fan motor is off, operating at half speed, or running full speed.

The 41 General Motors engines are cooled by units with vertically-mounted water cooling coils (two on each side) and vertically-mounted oil cooling coils (one on each side). The single-pass water coolers use an aluminum core.

The single-pass, low pressure drop, oil cooling coils are of $\frac{3}{4}$ in. x .049 tubes, ferruled and rolled to the tank. Fins and turbulating-type agitators are also aluminum. Easy maintenance is insured because the ferrules are large enough inside to permit withdrawal of the agitator chains.

Water Supply

Due to ground structure in this part of the country, considerable difficulty was encountered in obtaining an adequate supply of satisfactory water for the engine cooling systems and other uses at the plant. In fact, it was necessary to go 28 miles to the Corpus Christi Filtration Plant at Calallen. Here, water is taken from the Nueces River, filtered and pumped to the San Patricio Plant through a 24-in. inside diameter steel pipe line, which is lined and coated with concrete.

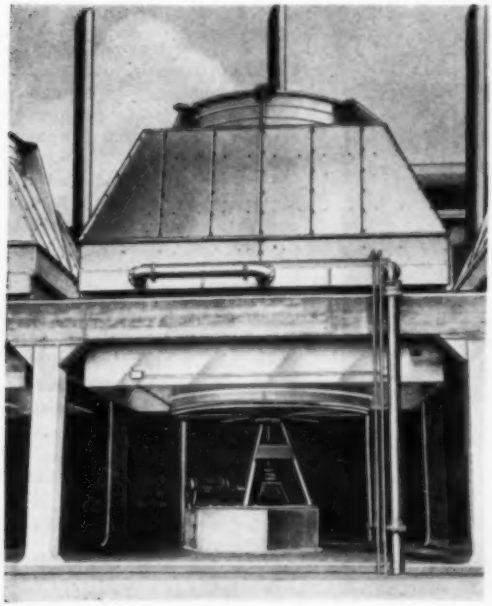
Joints in the line were welded. Installation was made by the Darby Construction Company and completed February 5, 1952. During construction, water was pumped from wells at the nearby city of Taft.

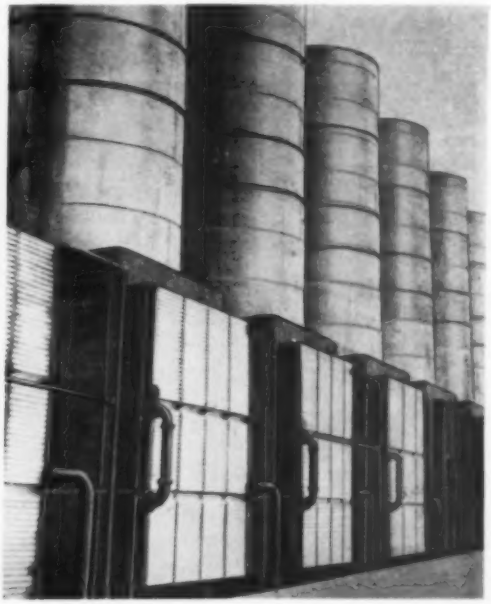
Zeolite water softeners are used at San Patricio to remove most of the calcium and magnesium carbonate salts. Further conditioning of the water is accomplished by adding super phosphates to neutralize the scale forming effects of any remaining elements. This then is the water used in all the main cooling systems of the engines and in the boiler plant.

Gas Supply

It is evident that the entire oper-

Cooling equipment for the 83 gas engines was furnished by Young Radiator Company. The unit for the Cooper-Bessemer engines is shown at left, and that for General Motors engines is shown at right.





ation of the plant hinges on a dependable fuel supply. For this reason, two separate gas lines are run into the plant from two separate gas fields. The entire plant can be run from either line, or both. These are 12-in. inside diameter lines, operating under a pressure of 100 psi.

The natural gas used is rated 1000 Btu per cu ft. There are oil type gas scrubbers and a metering house for each line.

Total plant consumption is estimated to be 48,000,000 cu ft per day—17,500,000,000 cu ft a year.

Each engine has its own pressure regulator to reduce the line pressure of 100 psi down to 60 psi for the General Motors units, and 50 psi for the Cooper-Bessemer engines.

Electric System

Pumps for the water and oil cooling systems for the engines, fans for the cooling units, lights throughout the plant, and all plant auxiliary units are powered by alternating-current generated in the "AC" building by nine Cooper-Bessemer 2500-kw engine-generator sets operating at 4160 volts. For use around the plant, it is necessary to step down this voltage to 480 volts for motors, and 220 volts for lights. This is done at five substations.

One substation is in the carbon plant area. A second serves the four pot rooms. A third and fourth serve the General Motors and the Cooper-Bessemer engine rooms. A fifth is located in the "AC" building itself.

Both mercury vapor units and incandescent lamps are used throughout the plant for lighting. Mixing the light provides natural color, yet permits taking advantage of the high efficiency of the mercury vapor units.

Pot Rooms

The General Motors power plant operates one pot line (two pot rooms). Its forty-one 2000-kw generator sets total 82,000 kw normal rating.

The Cooper-Bessemer power plant operates the second pot line (the third and fourth pot rooms). Its thirty-three 2500-kw generator sets total 82,500 kw normal rating.

Control System

Each of these two direct-current power plants has its own Amplidyne control system. The field of each generator is connected to the Amplidyne controlled motor-generator set to control generator output so that the actual pot line voltage can be varied from zero to 800 volts and regulated in any way desired.

Of course, greater efficiency of operation is the reason for going to the giant pots and the greatly increased pot line current in the original design of the plant (105,000 amperes compared to conventional 32,000 amperes). There are a number of important operating advantages to be obtained by going to the large pot.

Higher Efficiency

It has been found that the power efficiency of the reduction operation (the number of kilowatt hours required to produce a pound of aluminum) is influenced by the size of the pot used. Throughout the aluminum industry, 10 kwh of electricity per pound of aluminum produced is recognized as a good round figure representing the approximate efficiency of the aluminum reduction operation.

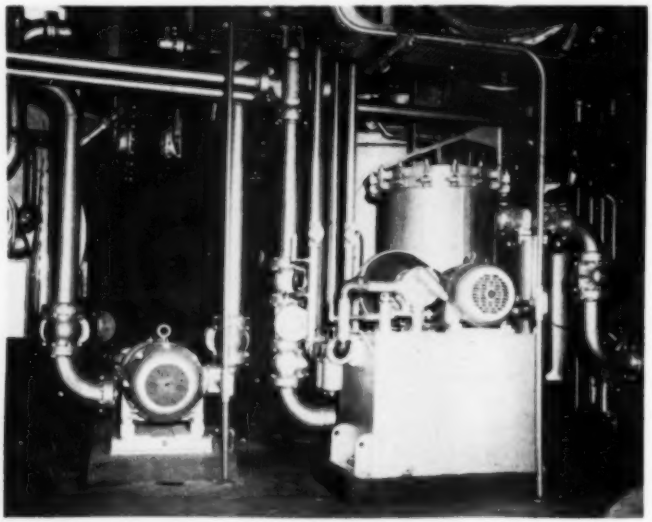
However, this is an electro-chemical phenomena and the conservation of heat possible in the large pot apparently makes possible important economies that reduce the number of kilowatt-hours of electricity required per pound of aluminum produced.

Too, it has been found that the larger pot contributes greatly to more uniform pot operation. The larger working area of the Soderberg anode used here (four times as big as at Listerhill) assures much steadier operation at the point of maximum efficiency. This, in turn contributes to higher overall average efficiency.

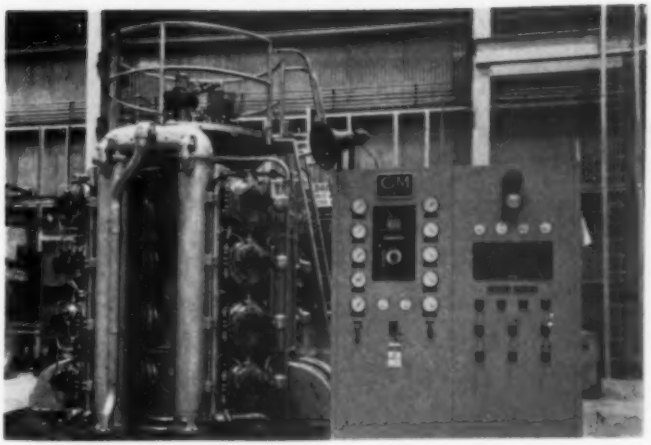
Bus Bar Installation

Each of the four pot rooms has 4,226,380 pounds of aluminum bus bars. In addition, there are another 1,500,000 pounds of aluminum bus bars in each of the two power plants.

The electrical conductivity of high purity aluminum is 64.6 per cent that of the International Annealed Copper Standard (at 68 F) on an equal volume basis. But since aluminum is so much lighter than copper, a pure aluminum bar weighing the same as a copper bar has more than twice the conductivity—212.9 per cent to be exact. This means that 1 pound of aluminum is



View of the floor below the General Motors units. The scavenger is at extreme left, and the air blower and cooling water pump are in left foreground. In the right center foreground is the actuator or reservoir and pump with the oil filter immediately behind.



One of 41 General Motors' gas-burning diesels. Each engine has 16 cylinders, arranged like two V-eights, V-to-V, stood on end. Vertical shafts extend down through the floor to drive forty-one 2000 kw d-c generators.

equivalent electrically to 2 pounds of copper.

Aluminum has not yet been very widely adopted for bus bar use but its application for this purpose is growing at a tremendous rate. The fact that a total of almost 10,000 tons of aluminum bus bar (19,805,-520 pounds to be exact) is used at San Patricio alone indicates the potential of this application.

The fact that a pound of aluminum is equivalent electrically to two pounds of copper is not all the story, however. Because of its light weight, a pound of aluminum has almost three times the volume of a pound of copper. Therefore, use of copper bus bars was necessary on certain connections to the pot superstructure where there was not sufficient room for aluminum. So each pot room uses 880,300 pounds of copper bus bar also—and the power plant required another 160,000 pounds of copper bus bar.

The aluminum bus bar arrived at San Patricio in 40 to 42-foot lengths for straight runs, 5 to 22-foot lengths for anode connections, and 8 to 39-foot lengths for cathode connections. All aluminum bus bars have the same cross section—1½ x 10 inches. This is EC (Electric Conductor) Grade aluminum, weighing 18 pounds per lineal foot.

The stock is first cut to length, and then the bars are drilled for the bolted connections to anode or cathode straps and for bolts holding bus bars in groups and at joints. Electric gang drills are used to drill from 1 to 18 holes simultaneously. Drills operate at 850 rpm, and drill a 1¼ inch diameter hole through 1½ inches of aluminum in 45-90 seconds.

After cutting to length and drilling, bus bar goes to a bender where the bends required to fit around the pots are made. From this station, the bars are assembled into sets for the pots.

Right here, we should explain the general layout of the bus bar system more completely. Looking down one side of a cell, two riser buses are seen coming up out of the floor at each end and connecting to the corners of the anode bus.

The riser buses go below the floor surface and then connect to the buses from the cathode or pot of the previous cell. For our purpose here, we are using the word "pot" to indicate the cathode structure holding the bath of cryolite and dissolved alumina. Then everything above this pot we will call the "anode super-structure." And we will call the whole thing an "electrolytic cell" or just "cell" for short.

Thus the bus bar system connects the cathode or "pot" of one cell to the overhead anode of the next cell; the cathode of that cell on to the anode of the next cell—and so on down the line.

All surfaces to be joined by bolted connections are sanded smooth with a portable electric belt sander and then polished with a disk sander. Surfaces are then prevented from oxidizing by application of "No-Oxid," a material especially developed for this type of work. Only connections that must be later dismantled for maintenance of the pots are bolted. All other connections are welded.

The large aluminum bus bars are welded at all permanent connections. This not only improves the conductivity of the system, but eliminates many problems in maintaining bolted connections which tend to oxidize and overheat when carrying such large currents.

The new shielded arc method was employed for all welding, using a mixture of helium and argon as the inert gas shield. Flowmeters are set to supply helium at a rate of 40 cu ft per hour and argon at 8 cu ft per hour.

Aircomatic welding machines were employed using 2S bare aluminum wire, 1/16-inch in diameter, fed into the arc at 100 inches per minute. Usual current and voltage settings are 280 amperes at 6 volts.

Prior to welding, the end of one of the bus bars is beveled at a 45 degree angle. The other end of the other bar at the butt joint is left square. This provides a total included angle of 45 degrees for the weld.

Wherever there are any long runs of bus, provision must be made to allow expansion and contraction. The expansion joint is made from sheets or strips of 2S aluminum, 10 inches wide and 40 inches long. This replaces about a 3-foot length of the 1½ x 10-inch aluminum bar. Since the expansion joint is longer than the bar it replaces, it provides a loop which is used to accommodate changes in length of the bus.

To make connections to this expansion joint, the sheets are clamped solidly under pressure to form a square end. The end of bar fitting into the butt joint is beveled at 45 degrees and the weld is made as previously outlined for solid bar butt joints.

General Arrangement

The four pot rooms, each 1580 feet long, are arranged alongside each other with the electric power

(Continued on page 60)



That's a four-figure smile on the face of Marvin E. Brown (left), receiving a check for several thousand dollars from A. V. Wiebel, president of the Tennessee Coal and Iron Division, United States Steel Company. The originator of a new type mine conveyor system, Brown, section foreman at TCI's Docena Coal Mine, was presented the highest award yet made under the division's Employee Suggestion Plan.



This simple gadget, a new method of connecting conveyor pans which carry coal back from the working face to waiting mine cars, won for Brown the highest award yet presented under TCI's suggestion plan.

The T. C. I. Suggestion System and How It Pays

MARVIN E. BROWN, a section foreman at the Docena Coal Mine of United States Steel's Tennessee Coal and Iron Division was summoned to the mine superintendent's office.

"Get into your street clothes," he was told, "and report to TCI's general offices at Fairfield as soon as possible."

A couple of hours later he walked into the company headquarters, along with the Docena mine superintendent. There the two were joined by the general superintendent of coal mines and the manager of raw materials. Picking up executives as they proceeded through the building, they arrived at the office of Arthur V. Wiebel, TCI president.

Still completely unaware of why he had been called to the general office, Mr. Brown was presented to the president, who, smiling genially, handed the bewildered coal miner a company bank draft for several thousand dollars.

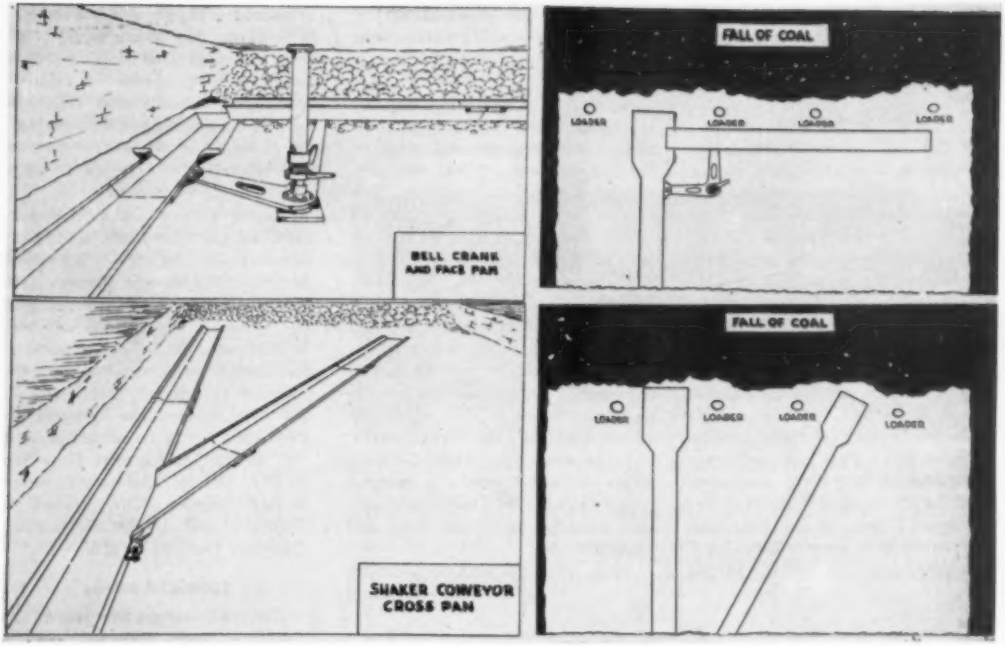
Thus, the young section foreman received the highest award yet presented under TCI's unique and liberal Employee Suggestion Plan.

That was TCI's way of sharing with Mr. Brown the benefits it is reaping from a device conceived by the miner and put into use at the Docena Coal Mine. Mr. Brown's invention is but one of many outstanding contributions made by TCI employees under the company's recently expanded suggestion plan, which since 1948 has paid out some $55,000 to employees for worthy ideas.

The Winner

The gadget devised by Mr. Brown is so simple that a great many mining engineers both in and outside the company have expressed surprise that it had not occurred to anyone before.

At Docena, a shaker conveyor is used to move loose coal from the working face to the mine cars. The conveyor is simply a series of trough-like pans, joined together and actuated by cams which impart to it a jerking motion to inch the coal toward the cars. Under the standard arrangement, a main pan



A contrast of the old and new systems of moving coal within the Tennessee Coal and Iron Division's Docena Coal Mine. The two top sketches show the conventional system, with the main line extending up to the working face and being fed by a tributary line, or face pan placed perpendicularly to it. The connecting device is a bell crank which transmits motion from the main line to the face pan. The two lower sketches show the system devised by Marvin Brown. Here the bell crank is no longer needed, but just as many men can load onto the conveyor as under the old system.

line is run from the mine track straight back into the working area. A vertical post, set between floor and roof, acts as the fulcrum for a bell crank connected to the main pan line and to a short tributary line which runs at right angles to the main line, this lever passing the shaking motion to the tributary line. The latter line is parallel to the working face, so that men working all along the face are able to load coal conveniently from the pile of loose coal on the floor.

Under this system, as the face advances, it is necessary at intervals to disconnect the vertical post, or bell crank, add more units to the main pan line and manually pull the tributary line forward, then reassemble the whole system. This operation, which sometimes has to be performed several times during a working shift, greatly reduces the time available for production and subtracts materially from the tonnage produced.

Brown spent considerable time thinking about the situation and trying to figure a way to eliminate it. Lying sleeplessly in bed one night, he began to turn the matter over in his mind. By the time he reported for work the next morning, he had the solution.

All the idea amounted to was taking a pan, clipping one end off at an angle, attaching it to the tributary line and fastening the whole line to the main pan line, forming a Y, rather than the L shape already in use. Simple it was, of a certainty. So simple, in fact, that it had been overlooked by all the brilliant engineers the industry could muster. But to the man on the job, with no formal education in engineering, it was just a practical way to solve another of the knotty production problems with which the industry is often faced.

Going to the mine machine shop, Mr. Brown made the first unit himself. Total materials used were one scrapped pan and two C-clamps. Total cost was $6.50. But the result has been a substantial saving, since the bell crank has been eliminated and one man can easily move the tributary line. Production has been increased in every section where the new apparatus has been installed. Furthermore, a safety hazard has been eliminated since, with the old system, it is often necessary to remove several mine props before moving the equipment.

Submitted through the regular channels established under the suggestion plan, Mr. Brown's idea reached the committee quickly. The committeemen were not long in deciding that here was a suggestion which deserved more than the usual treatment. Hence the big special award, a feature peculiar to TCI's suggestion program.

Forty Years

The Tennessee Coal and Iron Division has had a suggestion program for more than 40 years. Until 1948, however, there was little to distinguish it, either in methods employed or results obtained, from the run-of-the-mill program. Most

suggestions received prior to 1948 had pertained chiefly to apparatus and methods for improving safety conditions within the plants.

Cost Reduction

In the '40's, however, the steel corporation, concerned with rising costs of production, commenced a search for means whereby operating costs could be trimmed. A cost reduction program was put into effect at each of the operating subsidiaries.

In many cases where cost reduction campaigns are undertaken, there is a tendency to concentrate on a few large, ambitious projects and to ignore the value of accumulated savings from many smaller undertakings. The cost reduction committee at TCI early decided to consider all projects submitted, regardless of size. In the long run, they believed, a greater actual dollar saving could be effected by the consideration and installation of many tangible small projects than by expending all their efforts on a few big schemes.

Active in the campaign was the chairman of the Employee Suggestion Committee. Several other of the division's top officials were also connected with both programs. The cost reduction campaign made an appeal primarily to management personnel; however, it occurred to the chairman of the suggestion committee and his co-workers that, working through the suggestion plan, they could tap the imaginations, not merely of a few hundred foremen, superintendents and department heads, but of all 30,000 of the division's employees. Also, they reasoned, who would be more likely to know where economies might be effected than the people who actually run the machines and make the steel?

Thus, although the two programs remained separate and distinct, it was decided that there would be at least an integration of effort which would serve to enhance the value of both. To gain maximum effectiveness from the suggestion program, the committee voted to overhaul and liberalize it to make it more attractive to employees.

Among the first and most important changes to be made in the plan was a liberalization of the award features. Under the present system, awards are made, according to the value of suggestions adopted, in four categories. For suggestions considered very good, "A" awards, ranging in amount from $100 to $200 are made; those classified as good gain for their originators the "B" awards, which vary from $25 to $75; the third category, which merely carries the notation "adopted" and is rated "C" carries award of from $5 to $20.

Special Awards

The really unique features of the award schedule, however, are the special awards—the fourth category—and the semi-annual grand awards. The special awards, of which many have been made since 1948, are set by the suggestion committee according to its appraisal of the suggestions. In determining the amount to be awarded, the committee considers such items as safety, the size of the saving effected, if the idea is of a cost reduction nature, the ingenuity of the suggestion, the amount of time and thought put into its planning and presentation and other factors the committee considers pertinent.

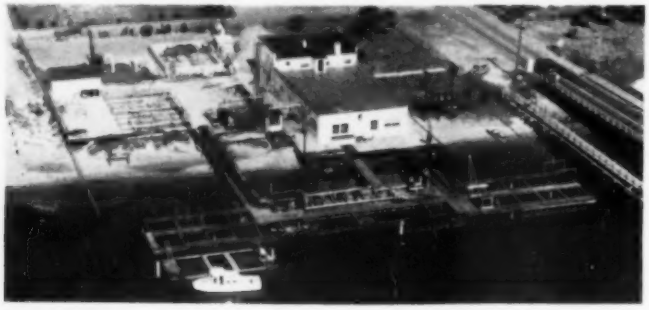
The committee, based on its appraisal, submits its findings and recommendations for award to the division's president. The president has never overruled a decision of the committee on any special award.

The semi-annual grand awards, also a feature peculiar to TCI's program, have had a great deal to do with increasing employee interest in the suggestion plan. The average person enjoys participating in a contest almost as much as he appreciates receiving money. Capitalizing on the psychology of competition, TCI has added to its awards two $500 cash prizes every six months. One of these goes to

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Inco Completes Additions to Kure Beach Project

Additional laboratory facilities at Harbor Island and a new sea spray test lot at Kure Beach, near Wilmington, North Carolina, were officially opened by *The International Nickel Company* at a conference of over 300 research and other executives of all branches of industry, June 4-6th at Harbor Island. Started over 16 years ago, the Kure Beach project already has won an international reputation. While operated by International Nickel, the station has been conducted on an entirely cooperative basis and producers of competitive materials have united in the free exchange of information on the ravages of corrosion and marine growth.



At Harbor Island, the new addition consists of a new two-story building, which, with the original laboratory building, finished about a year and half ago, provides 8000 sq ft of indoor laboratory and other space. Another important addition is a full-sized salt water evaporator and distillation unit to study the effects of water treatment and design on corrosion and scaling of such units. Equipment includes a boiler plant with a capacity of 4000 lb hr at 125 psi. Mr. F. L. LaQue is in charge of Inco's Corrosion Engineering Section.

the wage earner whose suggestion was considered the best submitted from that group of employees during the half year, and the other is presented for the best suggestion received from a salaried employee during the period. These sums are over and above the amounts already received under the regular schedule of awards.

The idea behind providing duplicate grand awards was that the work of most wage earners is physical in nature, while salaried employees as a general rule are involved in supervisory, administrative or clerical duties which would place them in a position of advantage over wage-earners; not only would the nature of their work make greater the probability of their submitting first-class suggestions, but there is a likelihood of their being better able to reduce their ideas to concrete proposals.

Promotion

Simultaneously with the decision to pay more generously for good suggestions, a promotional campaign was begun to popularize the program and to bring it to the attention of all employees. As a kick-off, a colorful brochure listing the types of suggestion desired, outlining procedure for entry, and explaining rules of eligibility was mailed to every employee at his home. There followed shortly a letter from the chairman, encouraging participation and pointing out the gains employees stood to make through taking part in the program. Posters were placed on bulletin boards throughout the company's plants announcing the opening of the campaign. To make the placement of entries as easy as possible, suggestion boxes were placed prominently at all works—frequently near time clocks.

Promotional activities continue to play a big part in the program. After each presentation of grand awards, the names of winners are posted conspicuously. Every new or re-hired employee is given a copy of the brochure, and his attention is directed to the plan. Every time the program enters a new phase, full notification is given through posters and bulletins, and by word of mouth, from company headquarters down through channels to the crews in the mines and mills.

One of the most highly successful phases of the program was a short-term campaign called "Waste Prevention Week," which was conducted in 1949. For the best suggestion submitted from each works during that week, a $50 prize was given. From these local winners a selection was made of the best entry in the entire company, and its originator was presented an additional check for $150. All entries submitted during the week were also considered for awards under the regular program. That contest brought in more suggestions in one week than had been submitted during the entire preceding year.

That the rejuvenated suggestion program is showing results is indicated by the sums paid out in awards. In 1948, the year the stream-lined program was put into effect, only about $2,500 was paid. In 1949, the figure had climbed to $14,000, and in 1950, more than $16,000 was placed in the hands of employees submitting suggestions. Awards for 1951 amounted to $25,000.

Complete Confidence

According to the chairman, however, the promotional campaign and the increased monetary benefits to be gained from participating in the plan only partially explain its present success. A point which should by no means be overlooked is the manner in which the committee has worked to build the faith of the employees in the system.

"A strictly voluntary program such as this can be effective only as long as it has the complete confidence of the employees all the way down the line," the chairman declares.

"We have tackled this problem from all conceivable angles," he says. "First and foremost, we make absolutely sure that the program is administered with complete conscientiousness by everyone who has anything to do with it, from the top officials of the company down to crew foremen. Next, we keep the program so utterly simple that everyone can have full confidence that his suggestion will be awarded its just desserts. And, third, we see that all suggestions are proc-

$9 Million Rug Factory for Greenville, Mississippi

This huge factory, 500 ft wide and 1,000 ft long, will house carpet looms, dyeing equipment and auxiliary facilities for the production of axminster rugs. Built by the City of Greenville, Mississippi, it will be leased to the *Greenville Mills, Inc.*, a subsidiary of Alexander Smith, Inc., of Yonkers, New York.



Construction of the plant is a part of Mississippi's "Balance Agriculture with Industry" program, in which millions of dollars have been expended to bring industrial plants into the state. The Memphis plant of U. S. Steel's American Bridge Division will handle the steel fabrication and erection work for the factory, involving some 3,000 tons of structural shapes. All structural steel is expected to be in place by September. Steel is being shipped to the Memphis plant by the rolling mills of United States Steel, with the most of it coming from the Tennessee Coal and Iron Division's Birmingham plants. Architectural engineers for the plant are Mallett and Associates, of Jackson, Miss.

essed just as rapidly and awards are made just as soon as practical, so that the participants will not become disheartened or lose interest."

The Committee

The Employee Suggestion Committee is composed of 19 men, all extremely high in the ranks of the company. In addition to the vice president in charge of engineering, the committee includes general superintendents of all works, all chief engineers, the manager of metallurgy, inspection and research, and top men from the Industrial Engineering and Accounting Departments.

By putting only top men on the committee, TCI has assured itself that it has the best brains available on the job. Through selection of representatives from practically all major departments, it has made certain that there will be on the committee at least one man thoroughly competent to determine the practicability and worth of every suggestion submitted. Furthermore, since every works is represented, and the representative of each works will fight tooth and toenail to see that his men get consideration equal to that accorded to employees at other plants, there has been a standardization of treatment never before reached.

System and Procedure

If an employee has an idea he thinks will be worthy of consideration, he secures a suggestion blank from his foreman, supervisor or department head. This he fills out, with the help of the Engineering Department, if he needs it, giving full particulars as to what his idea is, how to make it work, and what it will accomplish. If it involves a mechanical device, he is asked to submit drawings.

The entry is then dropped into a convenient suggestion box, from which collections are made once a week by the superintendent's clerk, or, in the case of suggestions from general office personnel, by the suggestion clerk. This functionary then prepares an acknowledgment slip, which is returned to the employee, and forwards the suggestion to the general superintendent, who in turn relays it to the departments the suggestion would affect, for review and recommendations. When this has been accomplished, the general superintendent studies recommendations and discusses each suggestion at the weekly works operating meeting, where the worth of each is carefully weighed, and a recommendation for the amount of award is made.

If the suggestion is rejected in this meeting, the general superintendent informs the employee personally or by letter the reason for rejection. If an award is to be recommended, 20 copies of the suggestion, with recommendation, are submitted to the suggestion committee. The committee, which formerly met quarterly to pass on entries, now finds it necessary, because of the multiplicity of suggestions, to meet every two months. In sessions which may last four hours or more, and sometimes involve spirited debate, it carefully scans all suggestions and sets awards. Then, as soon as possible, checks are prepared and presented to employees by general superintendents or department heads. Special and grand awards, however, are generally presented by the president or someone high on his staff.

Wide Scope

All phases of the company's operational and business activities are covered by the suggestion program. Among the many fields in which personnel are encouraged to make suggestions are improvement in quality of products and methods of production, better service to customers, accident prevention, waste prevention, improvement in tools and equipment, new products or new uses for old products and increase in production. Any employee is eligible to submit a suggestion in any field. If a suggestion which appears to be good enough to merit a cash award is received by the Cost Reduction Committee, it is immediately returned to the general superintendent of the works from which it originated with instructions to submit it to the suggestion committee.

The least impressive suggestion receives just as much consideration as the ones which appear to have considerable worth. Anyone who feels that his suggestion was unjustly rejected or did not get the award it deserved may appeal the decision to the committee chairman.

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83 Gas Engines—185,000 kw

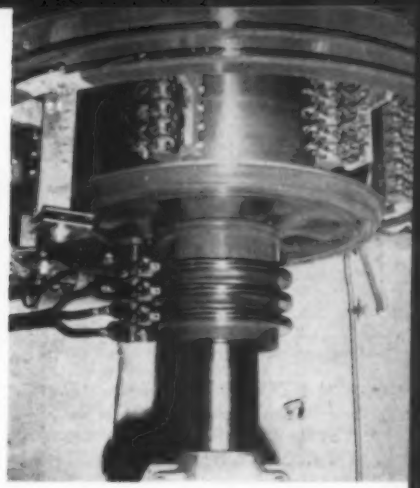
(Starts on page 50)

plants at one end. This arrangement results in the least possible length of bus with the lowest possible power loss. Each pot in a conventional pot line operates at a voltage drop of 4.5 to 5.5 volts, and direct current electric generators operate most efficiently at several hundred volts. Therefore, the pots are connected in series. Six hundred volts at 32,000 to 50,000 amperes will handle the electric power requirements of a conventional pot line, but as previously mentioned, each pot line in this plant requires about 105,000 amperes at the same voltage.

Since each d-c power plant serves one complete pot line, all units selected to run on a given load demand must operate on a common bus. This means that each engine operates at full speed, full load, and at bus voltage, whenever in operation. Speed of an engine is set up to the proper value when it is started up and put on the line, but from this point on, loading and variation of voltage is done on all engines by a single operator who is located at the main load master control panel for the pot line. This load control panel is contained in an annex building located between the two d-c power plants. The operator at this station observes which units are running by means of indicating lights, and can manipulate load and voltage as though all units running were one generator rather than several. Furthermore, he can trim load on any individual unit as needed to equalize load among units.

194 GAS ENGINES 350,000 HP

Alcoa at Point Comfort, Texas, Expands Gas-Fueled Power Generating Facilities



Lower part of one of 74 Elliott Co. generators, showing commutator and slip rings. Generators are directly coupled to the 12 cylinder Nordberg radial engines at Alcoa's Point Comfort Works. They are rated at 1100 kw d-c at 667 volts, and 135 kva a-c at 425 volts and 24 cycles.

THE FIRST new aluminum smelting plant built after World War II and the first in the growing Texas aluminum industry was the Point Comfort Works of the Aluminum Company of America. A semi-technical description of the facility was featured in the July, 1950, issue of SP&I.

The original power plant included 120 engine-generator units, 40 of them housed in each of three buildings. To increase the power output, 74 new units have recently been installed in two additional buildings. Plant now has a total engine rating of approximately 350,000 hp.

Engine Design

All 194 engines, built by Nordberg Manufacturing Company, are of the two-cycle, radial type, incorporating an advanced design of dual spark ignition. The engines have a 14 in. bore and a 16 in. stroke.

Although the 74 new engines are similar in general design and appearance to the 120 original ones, there are important differences between the two. The new engines have 12 cylinders instead of 11 and, since the cylinders are the same size, the new model develops about 9 per cent more power.

In addition, a distinctly new type of stabilizing mechanism is employed in the new engine to permit the master crankpin bearing assembly to gyrate and yet to prevent it from rotating in response to the torque from the connecting rods. This was accomplished in the original 11-cylinder engine by means of a planetary gearing system.

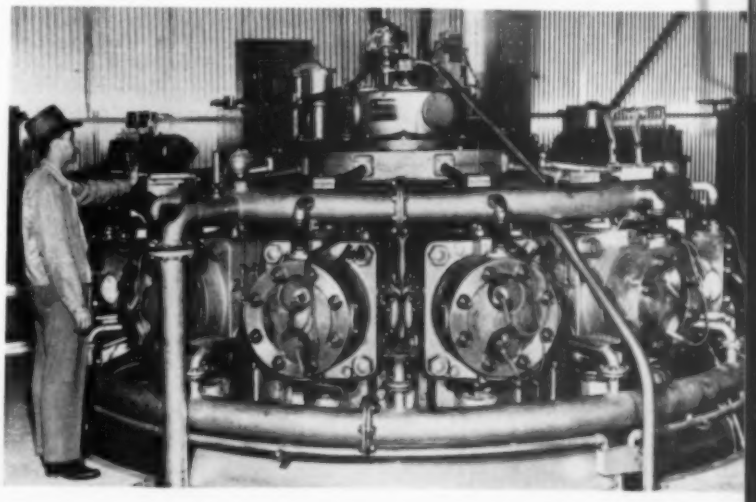
In the new engines, however, a simple crank mechanism operating between two connecting rods and their knuckle pins is substituted for the gearing. The relatively small torque tending to rotate the master crankpin bearing assembly is absorbed by small reactions on two of the pistons.

Although the same impulse generator is used for ignition on both model engines, it is combined with the distributor as a single unit in the new model, instead of being driven separately.

In both models, intake and exhaust are timed by the pistons as they uncover ports in the cylinder walls. This eliminates intake and exhaust valves.

Natural gas is admitted by cage mounted gas valves. The valves are operated by a cam on the crankshaft and are so located that the gas is admitted into the path of the incoming scavenging air. This assures thorough mixing and efficient, economical burning of fuel. A valve inserted in the gas line and controlled by a hydraulic governor

(Continued bottom of page 62)



One of 74 twelve-cylinder Nordberg radial engines installed in two new power houses at Alcoa's Point Comfort (Texas) Works. Engines use natural gas for fuel.

Consolidation Coal Company, Fairmont, West Virginia, develops

on-the-job CABLE SPLICING SYSTEM

Fluids at room temperature changed from liquid to solid state with the application of heat.

A METHOD for quickly splicing heavy trailing cable on the job at the Consolidation Coal Company, Fairmont, West Virginia, uses Vinylite resin plastisols to help restore mechanical, electrical and dielectric properties at the splice.

Fluids at room temperature, Vinylite resin plastisols formulated and manufactured by Chemical Products Corporation, East Providence, R. I., are changed from liquid to solid state with the application of heat. This property plays an important role in the economical cable-splicing system developed by the Consolidation Coal Company.

Engineers Warn Coal Users Against Claims for Combustion Catalysts

A WARNING against unjustified or unproved claims for so-called combustion catalysts has been issued by the Technical Advisory Board of *Bituminous Coal Research, Inc.*, the national research agency of the bituminous coal industry.

It states that some users of coal are being persuaded to make expensive installations and trials of special treating materials or catalytic agents which are claimed to reduce smoke, soot, ash and clinkers and to increase efficiency. If such claims could be substantiated, the coal industry would be glad to encourage the use of economically-practical treating methods.

However, it has been the experience of this group of combustion engineers to date that the use of such materials in economically feasible quantities does not accomplish the claimed results and that their use is unjustified with coal. This conclusion agrees with the results of extensive tests made by the U. S. Bureau of Mines, as set forth in its Bulletin No. 404, "Burning of Coal and Coke Treated with Small Quantities of Chemicals."

The Technical Advisory Board feels that claims, testimonial letters, etc., should be ignored unless they are supported by authoritative evidence from competent, reputable and impartial engineering organizations, showing definite proof of the claims that are being made. To warrant consideration, the evidence must consist of detailed figures for strictly comparative tests during which all conditions were held constant except the presence or absence of the treating material, and such tests must be repeated to show whether the claimed results can be duplicated.

Combustion engineers associated with the coal industry are available to assist coal users in the solution of any problems that may be encountered in the use of bituminous coal.

Southern and Southwestern industrial and power plant personnel, desiring additional information on this item, should direct their inquiries to the *Bituminous Coal Research, Inc.*, 2609 First National Bank Bldg., Pittsburgh 22, Penna.

Power Expansion at Alcoa—Point Comfort

(Continued from preceding page)

varies the amount of gas delivered to the cylinders according to the load on the engine.

All bearings are renewable bushings, and the heads, pistons, cylinders, and bearings are interchangeable. This reduces to a minimum the number of spares required.

Generator Data

Seventy-four Elliott electric generators are located in the lower level of the new power houses and are joined to the engines by direct coupling. Each engine-generator unit, with its auxiliaries, operates independently.

Each of the 74 generators produces 1100 kw (d-c) at 667 volts, and 135 kva (a-c) at 425 volts and 24 cycles. The a-c power is used for driving auxiliaries such as the scavenging air blower, oil and water pumps, and radiator cooling and generator ventilating fans. This eliminates the need for a common auxiliary power system and the possibility of a total station interruption.

Electrical conductors in the plant addition are aluminum as they were in the original plant. This includes about 9 million pounds of aluminum bus conductor alone for the entire plant.

Addition of the 74 new engines will raise the daily consumption of gas at Point Comfort from 30 million to 50 million cu ft. Point Comfort gets its gas from both on-shore and off-shore wells. Alcoa buys gas from nearby sources and has also developed some gas wells of its own.

Tough, flexible Vinylite plastic has excellent insulating properties and resistance to moisture, abrasion, grease, oils and most chemicals; it also withstands temperature and humidity extremes to which such cable may be subjected.

The one-man operation is economical. Cost per splice is about $1.50 for No. 4 three-conductor cable. Labor costs for removing and installing new cables are eliminated and spare cable inventories can be reduced by using this on-the-job splicing method.

Case History Data

A single operator wheels a combination workshop and supply cabinet to the scene of a cable-break and permanently splices two or three-conductor cable, copper size No. 4, 2, or 1, in approximately 30 minutes.

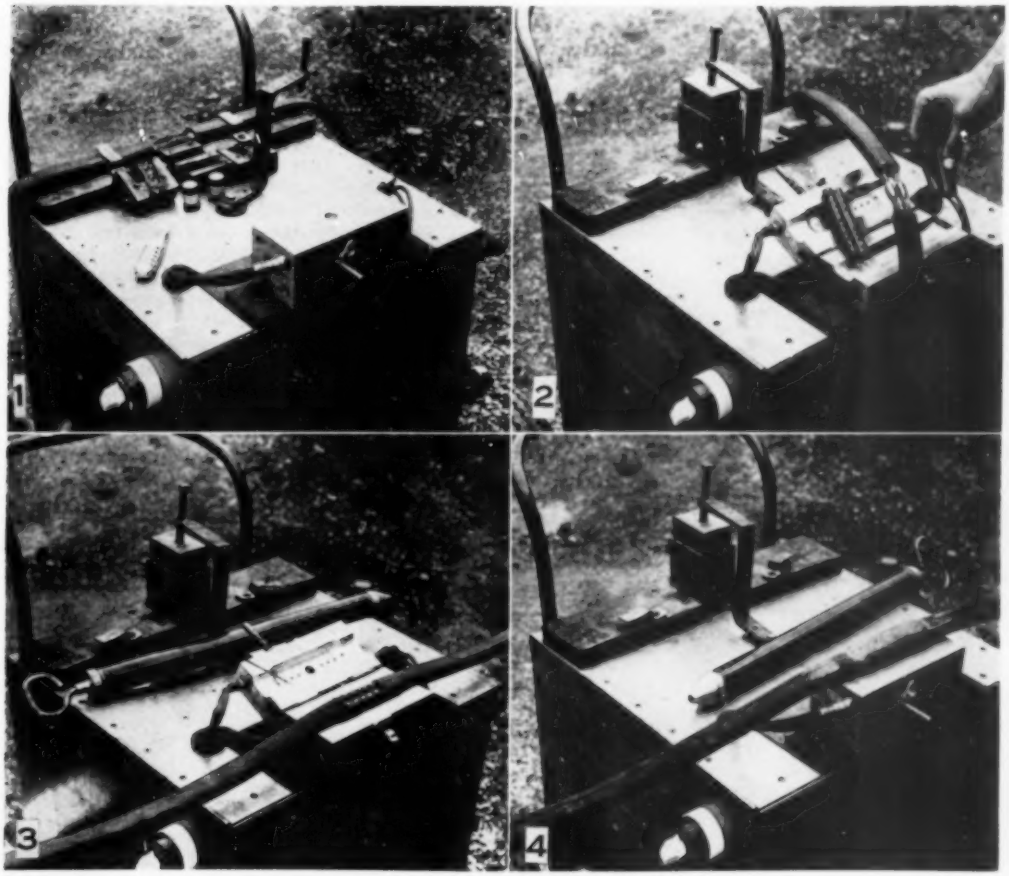
Trimmed cable ends, a short piece of jacket cut away from each end, are placed in a carbon mold (1) for copper-thermit welding of both conductors. Separate cartridges, ignited with a torch igniter, are used for each conductor, but both are spliced simultaneously.

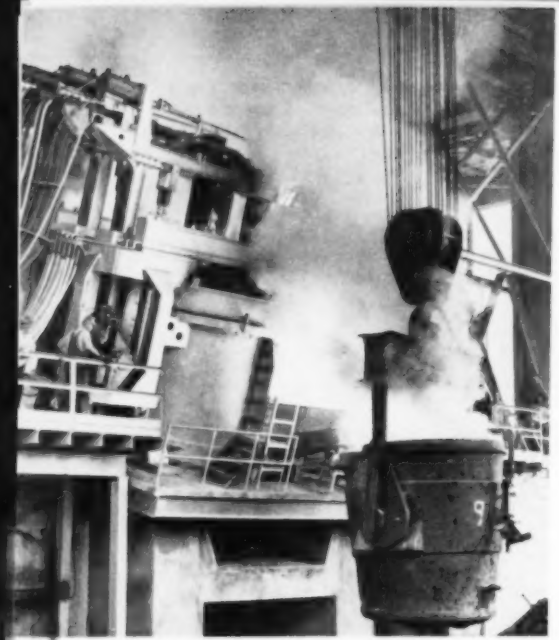
With rough runners trimmed off, the splice is ready to be wrapped in a piece of split tubing pre-formed of Vinylite resin plastisol (2) which separates and insulates the conductors. To make the separators, heated rods of correct diameter and spacing are dipped into Vinylite resin plastisol. Split lengthwise, the tubings are removed from the rods and cut to length as needed. Holes punched in the separator improve bonding with the finished jacket.

The separator is secured with insulating adhesive tape; jacket ends are cleaned, roughened and coated with an adhesive. The spliced cable is then laid in an aluminum mold on top of a small amount of Vinylite resin plastisol placed in the lower mold cavity to center the splice. (3)

Separate molds for each cable size consist of two sections, each containing two 150-watt heating units. A cable attached to the repair cart supplies 250-volt direct current.

With the mold sections latched together over the splice, a conventional hand-operated grease gun is used to force Vinylite resin plastisol into the mold. After curing five minutes at 325 to 375 F, the cable is removed, cooled, and excess plastisol is trimmed off. (4).





Atlantic Steel Company's

ELECTRIC FURNACE

Supplementing Atlantic Steel Company's three open-hearth furnaces, a new 60 ton electric furnace increases the company's total output to 300,000 tons annually.

BUILDING—Melt shop is 200 ft long, 130 ft wide and 90 ft high. Craneways extend an additional 260 ft on the east side and 60 ft on the west side.

FURNACE—Electric furnace is a top-charge basic-lined model J. T. Lectromelt. It has a rated capacity of 60 tons, although it is capable of producing 75 tons of steel ingots per heat. Shell diameter is 18 ft and internal capacity is 1750 cu ft. Four to six hours are required to produce a heat of steel. Annual capacity is approximately 112,000 net tons.

ELECTRODES — There are three graphite electrode columns, each composed of three sections. Each section is 20 in. in diameter and 72 in. long, making columns 18 ft long. It is expected that three sections will be burned off each day.

POWER—Furnace will use more than 6,500,000 kw hr per month supplied entirely by the *Georgia Power Company*. A new sub-station was built especially to bring power to the plant. It is supplied to the furnace through a *Westinghouse* transformer rated at 18,000 kva.

ACCESSORY EQUIPMENT—Three *Alliance Machine Company* overhead cranes are used: the ladle crane has a 110 ton capacity, the charging crane 60-ton capacity, and the ingot-handling crane 10 ton capacity. Other equipment includes: two 900 cu ft scrap buckets; one 1400 cu ft scrap bucket; 300 kw, d-c *Westinghouse Electric* generator for cranes; 750 kva *Westinghouse* sub-station transformer for auxiliary power; 500 cu ft/min *Fuller Company* air compressor; 20,000 lb capacity *Rotary Lift Company* elevator; 200,000 lb capacity Fairbanks-Morse scrap scales; water recirculation system to pump 850 gpm at 80 lb pressure to cool water from 120 to 95 F.

THE SOUTHEAST'S largest electric furnace, housed in Atlantic Steel Company's Plant Number Two in Atlanta, Georgia, was placed in operation in May. The new 60 ton furnace, with its annual capacity of 112,000 tons of steel, will increase the company's output by more than 50 per cent. The new privately financed plant, built at a cost of $2,500,000, is on a 9 acre plot, adjacent to the company's three 75 ton open hearth furnaces, rolling and finishing mills.

Furnace Operation

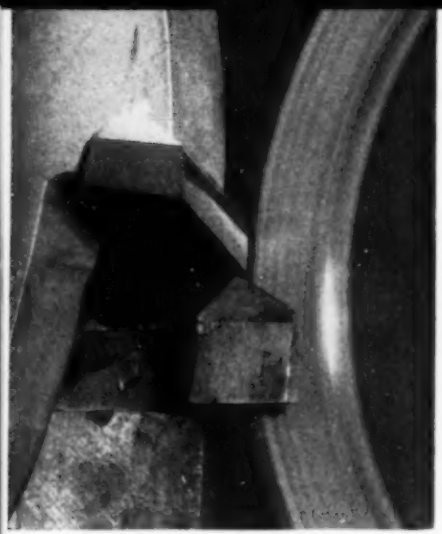
Since pig iron is not required in the making of electric furnace steel, scrap alone is charged. This scrap is loaded directly from railway equipment into charging buckets which have as much as 1400 cu ft capacity.

In charging the furnace, the roof and electrode assembly swing to one side, permitting the scrap to be dropped directly into the furnace from the bucket, which is suspended from an overhead crane. The roof is then replaced and the three graphite electrodes, each 20 in. in diameter and 18 ft long, are lowered into the furnace. The scrap is melted and refined by the arcing of high voltage electrical current through the electrodes and the scrap, which raises the furnace temperature as high as 2950 F. Later, one or more additional scrap charges are necessary to utilize the full capacity of the furnace.

After the melt is completed, and the steel is of the proper chemical analysis, the entire furnace is tilted forward, pouring the molten steel through a spout into a huge ladle capable of holding 80 tons of steel.

The ladle is then suspended over the ingot molds, and the molten metal is permitted to flow into the molds through a nozzle. The ingots solidify, are stripped from the molds and are then ready for further processing.

Robert S. Lynch, president of Atlantic Steel Company, said the new furnace and plant was visible evidence of the company's and employees' faith in the continued progress of the South. *T. M. Girdler*, board chairman of Republic Steel Corporation, Cleveland, Ohio, and father of Atlantic Steel Company vice-president *Joseph H. Girdler*, attended the ceremonies. Other leaders participating in the dedication on May 13th were: *William B. Hartsfield*, mayor of the city of Atlanta; *Charles F. Stone*, chairman of the board of Atlantic Steel Company; *W. E. Moore*, board chairman of the Pittsburgh Lectromelt Furnace Corporation, builders of the new furnace; and *Col. Ernest E. Norris*, board chairman of the Southern Railway System. Labor was represented by *E. F. McClellan* and *Jack McGee*, members of the local CIO steelworkers' union.



plant tested Work Methods

Faster, better and more economical ways of DOING - THE - JOB at Temco Aircraft Corporation, Dallas, Texas

C. R. Croxton, of Temco, took a piece of steel strap 3/32 x ⅜ x 2¼ in., heated it, and bent it in an offset. He then silver soldered a worn carbide cutter destined for the scrap heap to this strip, and ground the cutter to the desired shape on a diamond. The new lip rest was then drilled and tapped and attached to the grinder as illustrated above.

Grinding Aid

THIS carbide-tipped lip rest used to grind carbide mill cutters on Oliver Face Mill Grinders, has increased lip rest life from approximately two days to more than six weeks; yet the cost is no more than that of the heat treated steel lip rests previously used. Device was designed by *C. R. Croxton*, a grinder operator, who felt that there must be some solution to the problem of lip rests being eaten up in no time at all by the carbide spar mill cutters he was grinding. Principal is being adapted to lip rests for other types of grinders.

Special Router Guide

THE illustrated router guide, developed by *V. F. Danner* of Temco Aircraft Corporation, trims edges of aircraft skin sections flush with bolt angles quicker and easier than previous methods and also minimizes work damage.

As the bolt angles serve as the basis of joints between certain aircraft sub-assemblies, it is necessary to remove all skin material which extends beyond the bolt angles to insure a perfect fit. General industry practice was to use a file—a time consuming method, which left uneven edges and sometimes resulted in damage to the bolt angle.

With the illustrated guide, the same job can be done with a hand router. Adaptations of the tool are being used in various trimming operations in addition to that for which it was desgined, saving time, preventing rework and eliminating large amounts of hand trimming.



ROUTER GUIDE DESIGN—Made in one piece from a 1¼ in. length of 1½ in. bar stock. One end is machined to a smaller diameter and threaded to fit the housing of a pneumatic hand router. Center of guide is drilled out to house the router bit. Except for 3/16 in. shoulder near the threaded end, one side of the guide is cut flat, flush with the edge of the router bit and parallel to the center line. A deeper, narrow cut is made against the shoulder to allow the bit to contact the material to be removed. The deep cut rides on the skin edge and the flat surface slides along the bolt angle to control the depth of the cut, removing excess material in one operation.

Scrap Gaskets Utilized

GASKETS made of scrap neoprene now are being used on high cycle nut runners at Temco to prevent shorting out of switches and reduce a safety hazard.

Frank M. Wagner, small tool repairman, designed the gasket when he found as many as 28 of the 220 volt 180 cycle nut runners in the shop for repairs at the same time. All had burned out switches.

Upon investigation, it was found that metal chips were being drawn into the motor housing by the armature fan and thrown through a half inch hole, left for switch wires, into the switch box. Short circuits resulted, often fusing the switch box to the motor housing. Operators reported electrical shock and often suffered burns.

Wagner proposed that by drawing the switch wires through small holes in a scrap rubber gasket placed between switch and motor housings, metal chips could be prevented from entering the switch box. Since installation of the gaskets he designed, there have been no burned out switches and no operators have reported shock.

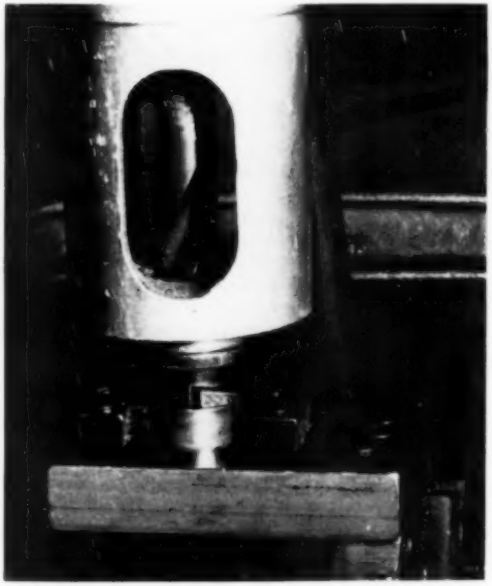


Adapter Design Facilitates Drilling of Hardened Steel

A NEW type adapter for locking Keller air drills in place when drilling large (.75-.875 inch) holes in hardened steel has speeded drilling operations and at the same time has made these operations safer and more accurate.

Developed by *W. O. Karnes* and *Louis W. Watkins*, Temco employes, the new adapter employs two sets of hardened steel lugs instead of the lug and set screw combination formerly used. One set of lugs is welded to opposite sides of the adapter and the other to opposite sides of a liner bushing attached to the jig. The top surfaces of the lugs on the adapter are ground at an 11 degree angle, and the bottom surfaces of the lugs on the liner bushing at a corresponding angle in the opposite direction. When the drill is inserted through the bushing in the jig, a counterclockwise turn of the drill motor locks the two sets of lugs together, and when the drill touches the work, the torque of the drill motor housing forces the lugs tighter, giving a firm union.

While the adapter was designed primarily for operations involving the drilling of hardened steel with large size bits, Temco supervisors say that it is superior for all Keller air drill operations, in that it provides a firmer union, reducing drill wobble and permitting holes to be drilled to much closer tolerances. Another advantage is that holes can be drilled from the bottom of a piece of material without turning it over.



From the safety standpoint, the new adapter is particularly valuable in that with the old type adapter when using large drills in hard material, it was possible for drills to break loose with sufficient force to fracture the operator's jaw, while with the new adapter, it is virtually impossible for the drills to break loose.

Drilling Simplified

A DRILL block designed by *W. W. Keas*, a tooling employe at Temco, is saving approximately one man hour per unit on Boeing B-47 rear fuselage assemblies.

The block was designed to simplify the drilling of pilot holes at the intersection of ribs and "Z" frames in the rear fuselage fuel door assembly. Prior to the development of Keas' block, the holes were laid out and drilled by hand. This operation caused excessive fatigue, was time-consuming and parts were frequently damaged, making rework or rejection necessary.



Made in pairs, one each for the left and right sides of the assembly, the blocks have a projecting lug which fits into the angle formed by the ribs and "Z" frames. A No. 40 drill bushing locates the pilot hole in the correct position. Twenty-two pilot holes now are being drilled in each assembly with the new blocks and other adaptations are under consideration.

Prefabricated Fence Panel Lowers Crib Erection Costs

A PREFABRICATED fence panel developed by *R. C. Russell* of Temco's maintenance department has both lowered erection costs on crib and warehouse fences and at the same time added greatly to overall plant appearance.

Among the major advantages obtained with the new panels are neat and uniform appearance of all cribs and warehouses; elimination of waste, both in labor and materials, when it becomes necessary to move or rearrange fences; provision of quick access to any part of a crib for moving large bins and similar items in or out; and the ability to erect quickly a fence of any required dimensions even for temporary purposes. The new fence can be erected without nailing or welding on the job.

Panel Design

The panels are 8 ft tall and are fabricated in 4, 6, 8, and 10 ft widths to give full flexibility in crib dimensions. Each panel consists of a welded framework of 1¼ in. standard, a horizontal brace of 1 in. standard pipe midway between top and bottom, and a covering of 2 x 4 in. mesh No. 11 galvanized welded wire fabric. Both ends of the top horizontal pipe, and the bottom ends of the vertical pipe uprights are left open.

Four standard fittings are used to erect and connect the panels. These are: 1) a base connection consisting of two 8 in. pieces of 1 in. pipe welded to a ¼ x 6 x 6 in. steel plate; 2) a top connection consisting of an 8 in. length of 1 in. standard pipe; 3) a corner fitting consisting of two 8 in. lengths of 1 in. standard pipe welded at right angles; and 4) a clamp made up of two 3 16 x 1½ x 5 in. steel plates connected by a 5 16 x 1 in. machine bolt.

The prefabricated panels and fittings are made up in advance, and a stock is kept on hand in the maintenance department sufficient to met all anticipated requirements. Included are standard panels with door and window provisions.

While material cost on the prefabricated panels is approximately double that of old style wood and wire fencing, and initial fabrication and installation cost is 50 per cent higher, this is more than offset, according to Temco maintenance officials, by the fact that the prefabricated sections can be moved and re-used continuously with little or no material waste; and once a supply of the panels has been fabricated they can be installed at approximately one-half the cost of the previous type.



In erecting the fence, pipes on the vertical legs of two adjoining panels and the piece of pipe used as a top fitting are inserted in the ends of the top horizontal members of the two panels. Panels are then locked together with one clamp. Same procedure is followed on corners except that the welded angle is used as a top connection instead of the straight pipe. To change a panel, clamps can be removed with a wrench and section slid out of the fittings in a matter of minutes.

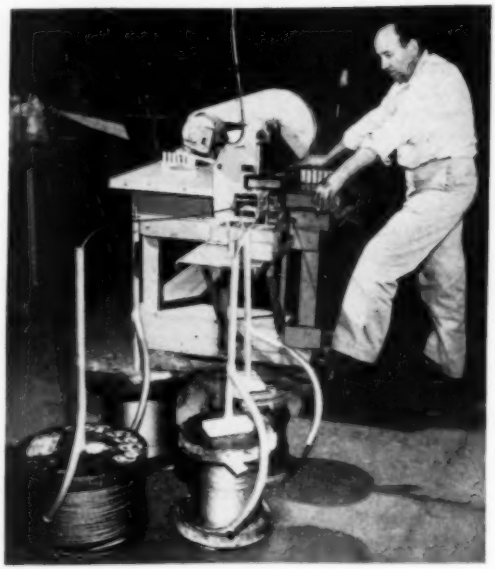
Cable Feeding Assembly

A CABLE feeding assembly made of two pieces of welded tube has eliminated the need for the large wooden racks previously used to hold spools of cable.

Developed by *K. W. Goggans*, an employe in the Temco Tubing and Cables Department, the device consists of a straight piece of tubing with one end flared, to which is welded just below the flared end a second piece of tubing bent in the form of a modified semi-spiral. The open end of the curved tube likewise is flared.

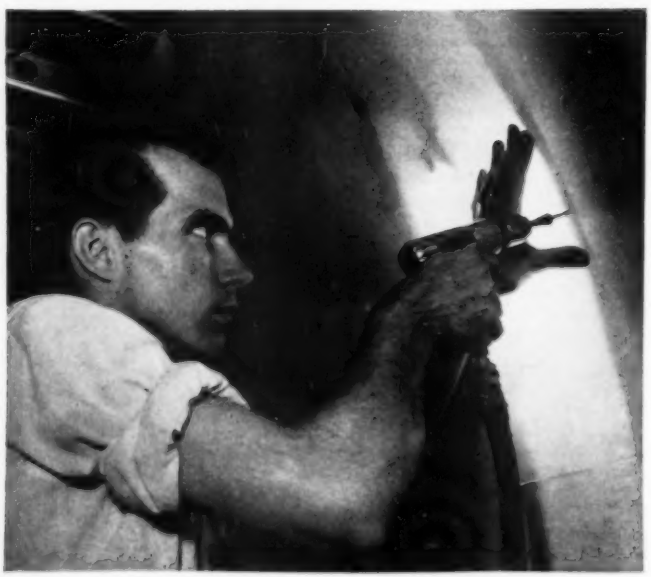
In use, the spool of cable is placed on end, and the unflared end of the straight tube is inserted in the top of the spool. The cable then is threaded through the curved tube and out through the top of the straight tube. A pull on the cable causes the tube assembly to revolve around the spool, unreeling the cable and feeding it out as required. Kinks are avoided by allowing the cable to turn as it is withdrawn from the reel.

Goggans' device not only eliminates the need for the spool racks, and the time and energy required to load heavy spools onto these racks, but it also permits faster unreeling of the cable, particularly in the case of large spools where it was necessary to roll the spool in order to unreel cable with the old type racks.



Drop Light Method Supplants Template

A NEW method for installing Fiberglas backing boards in Boeing B-47 rear fuselage sections now is saving four manhours per ship at Temco, and in addition, provides a far neater installation than previously was possible.



Suggested by *Buck J. Scott*, a Temco installation mechanic, the new method in effect substitutes a drop light for a template in one complete operation. Prior to Scott's suggestion, the backing boards were pre-drilled with a template and the same template was used to spot the holes on the side panel frames for installation. After spotting, the holes then were checked for proper location, and any holes which fell in a radius or failed to provide proper edge distance were moved before drilling. In installing the backing board, it then was necessary to redrill holes in the backing board where they had been moved on the frame, or to pull the backing board to line up the holes. This latter operation caused wrinkles in the installation.

Following Scott's suggestion, the backing board has been predrilled as in the past, but instead of spotting the holes in the frame with the template, the trimmed and predrilled backing board is



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clamped securely in its proper location. A small drop light then is placed behind the backing board, and since the board is translucent and the frames are opaque, it is a simple matter to spot the holes from the backing board. Those which fall in the radius or lack sufficient edge distance then are redrilled directly through the backing board into the center of the frames.

Broom Handle Adapter

A BROOM handle adapter designed by *R. A. Weaver*, janitor leadman at Temco, not only is eliminating a high percentage of the broom handle breakage at the plant, but in addition permits reuse of the broken handles when breakage does occur.

The adapter consists of a piece of aluminum bar stock about 6 in. long and 1⅛ in. in diameter, one end of which is hollowed out to provide a tube 3½ in. long with a 15/16 in. inside diameter to accommodate the broom handle. The other end is threaded with a standard broom thread to screw into the broom.

Prior to equipping all brooms with these adapters, Temco was breaking approximately two broom handles a day. The breaks would occur where the threaded portion started, and the handle would have to be thrown away. After the first break, a new handle could be screwed into the other side of the head, but when this broke, the head would have to be discarded too, whether it was worn or not.



Pneumatically Operated Draw Bar Cuts Down on Arbor Changing Time

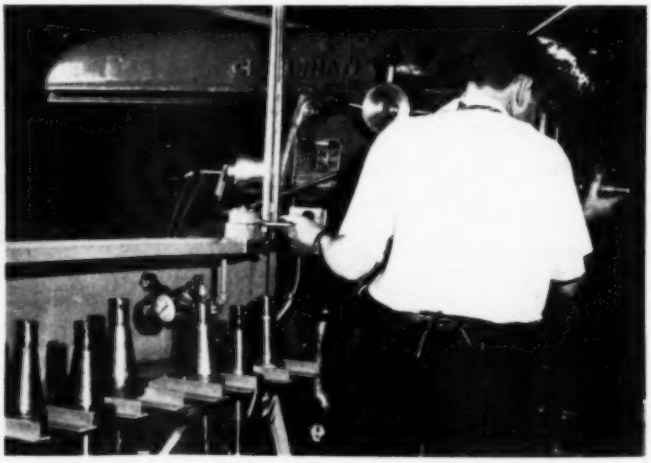
A PNEUMATICALLY operated draw bar developed for a #3 Cincinnati milling machine by machine shop personnel has reduced the time required to change arbors from an average of three minutes to an average of ten seconds a change.

The Temco developed attachment utilizes a 6-in. pneumatic cylinder, operating at 40 lb pressure, and a quick change adapter on the arbors. The pin on the draw bar is coordinated with the key on the spindle. All the operator has to do to change arbors is to press a button to release pressure on the cylinder, turn the arbor a quarter turn to disengage the quick change key, remove the arbor, insert a new arbor, turn it a quarter turn to engage the quick change key, and press another button to restore pressure.

The pneumatically operated draw bar, according to *P. F. Young*, assistant superintendent over Temco machine shops, was developed for a specific job in line with the company's policy of continuously analyzing each job in the shop for a faster, cheaper and better way in which it can be accomplished.

Job Requirements

The particular job in question was a heavy welded assembly which called for a variety of milling, boring, center-boring and reaming operations at very close tolerances. Altogether ten changes in arbors were required. Due to the weight of the assembly it was not considered practical to move the work to different machines for different operations, yet the close tolerances required such a complicated and expensive fixture that the use of duplicate fixtures likewise was considered impractical. Thus faced with the necessity of using only one machine and still meeting schedule, the machinists realized that their only hope was to cut down on arbor changing time, and the drawbar attachment proved the answer.



A Temco machinist changes arbors on a No. 3 Cincinnati milling machine equipped with the pneumatic draw bar. The change takes only a matter of seconds. In the left foreground is a rack of arbors equipped with bayonet fittings for use with the pneumatic draw bar. Left rear on the machines can be seen a portion of the pneumatic cylinder used to operate the draw bar.

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Marley Double-Flow with Atmospheric Section

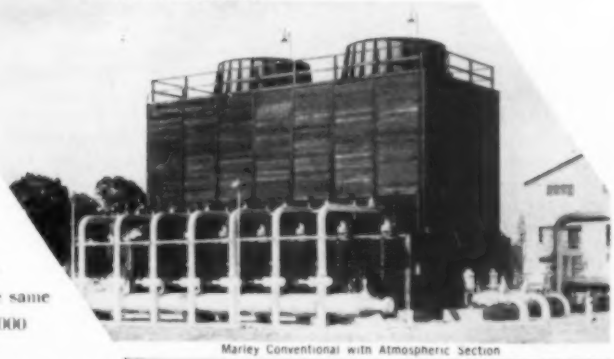


Marley Forced Draft DriCooler

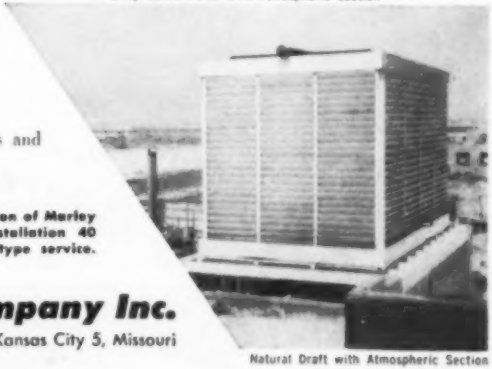
Whatever method of cooling your plant requires, whether cooling medium be air or water, you'll find the finest equipment in the complete Marley line.

Marley Dri-Coolers are increasingly popular as more and more plants utilize air cooled heat exchange. The flexibility of header design and finned tube arrangement makes Dri-Coolers ideal for cooling of jacket water and lube oil and other high level cooling, either singly or both in the same unit. They now serve plants from 50 hp to 23,000 hp, in many countries and climates.

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Natural Draft with Atmospheric Section

PRECOOLING AIR is another function of Marley cooling towers. In a single installation 40 Marley Aquatowers are in this type service.

MARLEY

The Marley Company Inc.

Kansas City 5, Missouri

Selection of Compressor Controls

BY
R. A. SCHAEFER
Engineer
Worthington Corporation

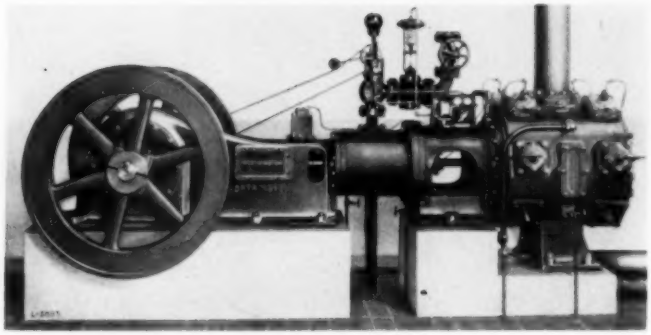


Figure 1

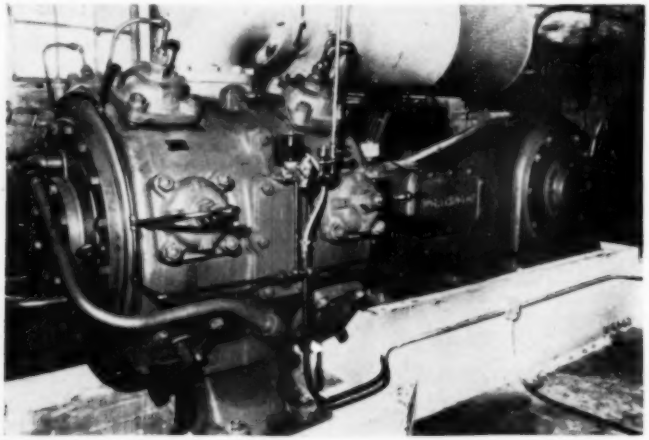
The aim in controlling compressor output is to eliminate, as far as possible, operation at loads far in excess of immediate demand.

THE true measure of economy of compressor performance, of course, is the brake horsepower consumed per cubic foot of gas compressed, when measured over a long period of time. The inevitable conclusion then, is that operational thrift is closely associated with capacity control. Therefore selection of the control equipment is of vital importance in the proper functioning of pressure equipment.

The most primitive concept of a compressor, the hand-operated bellows, was void of any of the complexities of control presented by modern day problems and applications, to compressed gases. At that time, the operator merely stopped pumping when sufficient gas was obtained, and began again as the demand increased.

Larger capacities and higher pressures, together with the advent of motor and steam driven compressors however, provoked the design of various types of controls to suit particular needs, that ranged from start-stop to multi-step, constant speed governing.

Figure 2



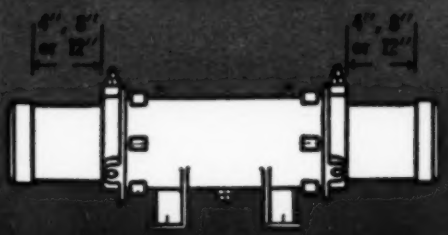
Variable Speed

In any compressed gas application, the ideal governor arrangement would be to provide only that amount of air or gas required, with each stroke of the unit. Steam driven compressors, and other variable speed prime movers, closely approach this condition and are limited only by minimum speed requirements.

Figure 1 depicts a standard governing arrangement for a steam driven compressor, wherein the diaphragm valve, activated by changes in the discharge air pressure, is utilized to control the speed, and subsequently the capacity of the unit, by throttling the inlet steam down, to coincide with an increase in pressure.

Variations of this principle are employed on steam valves embodying variable cut-offs in their design, wherein the governing element, sensitive to speed and pressure fluctuations, changes the point of steam cut-off to reduce, or increase speed

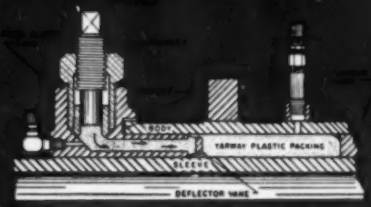
YOU NEED FEWER JOINTS



With Yarway Gun-Pakt slip-type expansion joints you need *fewer* joints than with other types, because each sliding sleeve has a traverse of 4", 8" or 12" . . . maximum expansion being 24" for a double-end joint.

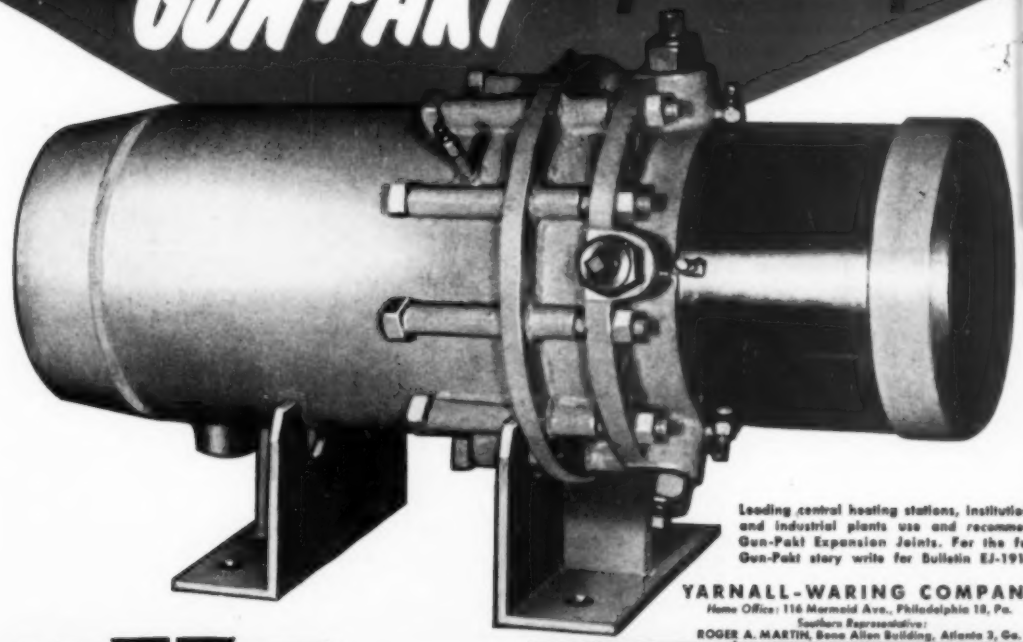
For example, one single-end Yarway Gun-Pakt joint with an 8" traverse is all that is needed for a 200 ft. run of steel pipe carrying saturated steam at 250 psi.

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YARWAY GUN-PAKT EXPANSION JOINT

and maintain capacity within predetermined pressure points.

To acquire variable speed control with a-c induction and synchronous motors as prime movers, the expense and inconvenience entailed would far exceed the gain; therefore compressors using these drivers are controlled by constant speed devices. By-pass control, the most widely used agent of regulation, permits the capacity of the compressor to be altered, while the unit operates at a constant speed.

By-Pass Control

Where air demands are relatively consistent, and the load and unload cycle not too frequent, 2-step bypass control, also with constant compressor speed, is normally used. Loading takes place in either of two (2) steps, 100 per cent capacity, or 0 per cent capacity. At a preset pressure limiting point, a pressure switch, activated by discharge air pressure, opens, to allow air to pass into unloaders, which force open the suction valves, allowing the air in the compressor cylinder to pass freely back and forth through the open ports, with no compression taking place. With a decrease in the discharge pressure, the switch closes off the air supplied to the unloaders, vents out the entrapped air, and permits the valves to resume their normal, uninhibited operating position, following which the compressor returns to operation on 100 per cent load conditions. An unloading system of this type, which is probably seen more frequently than any other, is shown installed on the compressor in Figure 2.

Intake Throttling

Intake throttling is sometimes used to achieve a capacity reduction, but its principal working feature, throttling the intake air to decrease the air volume to the cylinder, entails disadvantages in that the internal temperatures become extremely high due to increased ratios of compression.

Start-Stop Control

In installations where air requirements are sporadic and intermittent, as in the case of a starting compressor for a diesel engine, start-stop controlling is a most feasible selection. The compressor in this case, shuts itself down when demand is low, restarting again upon an increase in air require-

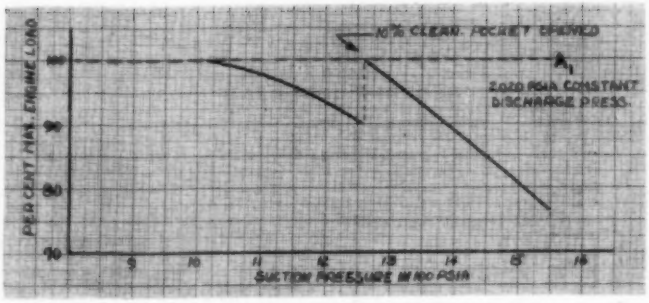
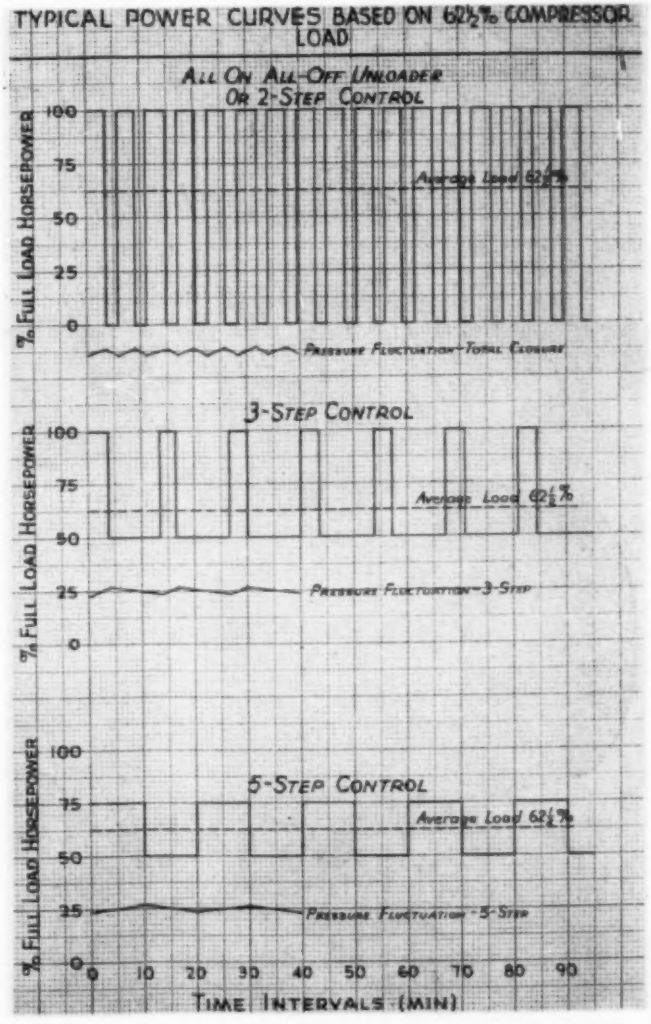


Figure 3 (above) and Figure 4 (below)



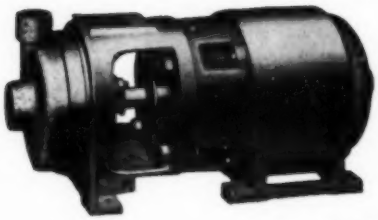
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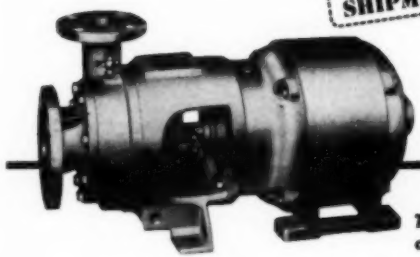
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ments. It should be noted here, that since the compressor in this instance is starting and stopping when the load is extremely close to its peak, some provision must be incorporated into the control for initial unloading, to prevent the possibility of excessive starting load on the motor. Otherwise, frequent overloading would decrease motor life.

Clearance Pockets

Again, some installations which have predictable demands for long periods of time, find wide usage for clearance pockets in their compressors. The clearance pocket, either manually or automatically operated, governs the compressor output by increasing the clearance volume of the cylinder when the demand is low, thereby permitting a greater number of expansions of the entrapped air, which in turn decreases the volumetric efficiency, and its dependent capacity.

An angle gas engine compressor for example, may have a gas requirement range of 1000 cfm to its maximum capacity of 3000 cfm. Most compressors of this type have capacity control built into the engine governing system, which will permit a speed reduction of about 50 per cent. Discounting valve losses through gas velocities at different speeds, the capacity will be reduced proportionately. If the demand falls still lower, and will remain so for an approximate known period of time, clearance pockets may be used to good advantage to regulate delivery.

By the same method, overloading of the engine may be avoided when confronted with a variable suction pressure, as is the very frequent case in gas pumping stations.

Figure 3 shows a typical bhp curve with varying suction pressures, and a constant compressor discharge.

As the suction pressure decreases, the load curve approaches the load limit, as indicated by the engine rating curve, A_1 with the opening of a 10 per cent clearance pocket, the bhp drops considerably below the peak engine design load, forestalling the possibility of overloading the engine. By opening other clearance pockets, as the bhp load curve once again approaches the critical point, the load curve can be held within safe limits.

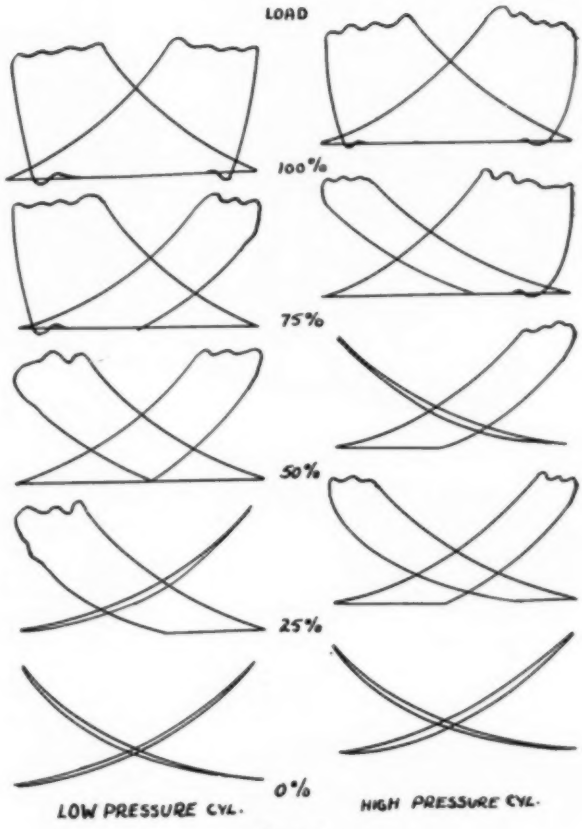


Figure 5

Combination Methods

Combinations of clearance pocket unloading, and by-pass control are not uncommon, being found frequently in multi-step controlling.

Capacity control in steps of three or more, is the constant speed compressor's answer to the desire for a closer approach to the mean average power requirement, as exemplified by those units employing variable speed control.

Load Curves

If the demand were exactly equal to the compressor capacity, the mean average power requirement curve would be a straight line in the per cent load versus time graph.

Such a condition never exists, of course, and further, would be impractical in that the installation would be operating on hair-line boundaries, with no available reserve to compensate for leakage, plant expansion, or excessive air needs.

In this hypothetical case, however, the pressure curve would be devoid of any fluctuations, and the perfect installation would exist.

As shown in the typical power curve of Figure 4, the greater the number of steps, the closer will be the approach to the mean average power requirement.

With 5-step control, the increments of control are in steps of 25 per cent, and this permits the compressor to float, at times, between 75 and 50 per cent load, as compared to the extreme cycles exemplified by the 2-step, or all-on, all-off control.

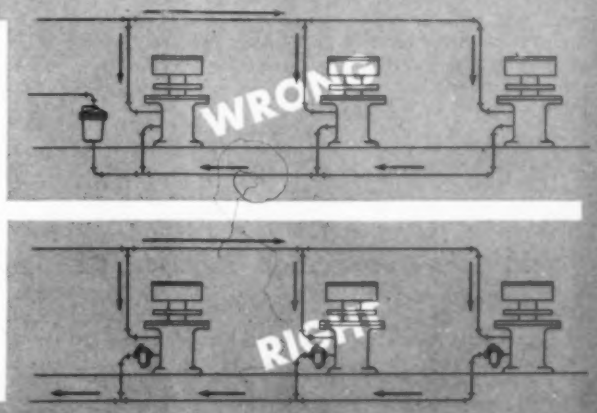
The Indicator Cards of Figure 5

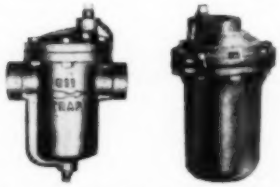
A good trade: How 50 Armstrong traps saved 14 tons of coal per month . . .

User changes from Group Trapping to Unit Trapping

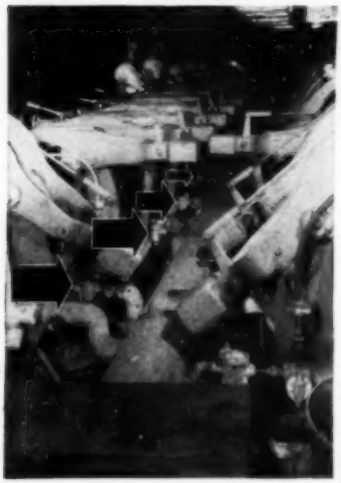
THE drawing labeled "wrong" shows a group of presses drained by a single trap. With this hook-up, condensate and air from one or more presses may fail to reach the trap because even the slightest pressure difference between the units will cause a back flow from a higher pressure unit to a lower pressure unit.

The drawing labeled "right" shows unit trapping, each press drained by a single trap.





Armstrong Steam Traps are available in side inlet-side outlet or bottom inlet-top outlet body styles to best meet your piping requirements.



View of a battery of individually-trapped clothing presses at M. Wile & Company, Buffalo.

AN EXAMPLE of the benefit to be gained from Armstrong Unit Trapping is found in installation at M. Wile & Company, Buffalo, N.Y., clothing manufacturers.

A single steam trap was being used to drain each group of 4 to 6 pressing machines. After changing over to the use of an individual Armstrong trap on each of the fifty presses in the plant, the company reports that, because of the resulting more efficient use of steam, coal consumption dropped by 14 tons a month. There was no reduction in work load. This fuel saving when held up against an investment of about $500 in steam traps was rightly considered *a good trade.*

There are other advantages to Armstrong Unit Trapping. Almost invariably machine temperatures are higher, heat-up is faster and output is increased. The traps themselves are thoroughly reliable, seldom need attention. The design, materials and workmanship in the trap mechanisms for low and medium pressures are identical to those used in Armstrong traps for power plant service at 900 degrees F and 950 lbs. pressure, so they last for a long, long time.

Your local Armstrong Representative will be glad to discuss the savings possible in your plant through Armstrong Unit Trapping. Call him, or write:

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depict the actual effect of a 5-step control in its governing sequence.

Controllers should be methodically selected, and applied with the care that goes with the compressor selection, for the compressor will offer operational satisfaction and service only as good as the control incorporated in it, will allow.

Some particular installations may have occasion to call for controlling steps in smaller percentages of reduction, than that offered by 5-step control, in which case some manufacturers offer a 9-step governor, with capacity reduction in stages of 12½ per cent.

Many variations of the foregoing controls are designed and functioning successfully in the field, but with the consideration of costs, practicability, and of course the ability of a control to perform correctly a specified job, no one type control will answer all purposes.

INCENTIVE PAY—Before and After

at Knox Corporation, Thomson, Georgia

Better methods may be had without incentive pay but incentive systems are rarely present without the best methods. Everyone is busy discovering and applying new production ideas and methods.

THE incentive pay system at the Knox Corporation at Thomson, Georgia, has now been in effect for approximately one and one-half years. Its application has been a success from both management's and labor's viewpoint, for in the overall picture costs have been lowered, and effective wages raised.

The incentive system came into reality at the Knox Pre Fab House Plant about the middle of 1950. It was no easy job to set up, for, unlike most operations on incentives, there were practically no short cycle operations and almost every job contained numerous variables. Most of the operations have cycles of one hour or more. These long cycles posed some serious problems but the obstacles were overcome by breaking the long cycles into short cycles and then developing standard data based on the short cycles.

At present, almost all departments in the Knox plant are on incentive. The only departments not on incentive are those in which the work amounts to job orders. However, it is the intention of the Knox Corporation to place even these departments on incentives and every effort is being made to develop effective methods for doing so.

So this, then, is the present situation: approximately 90 per cent of the plant on incentives, and most of these on for more than one year. This is the picture to be compared and evaluated with the pre-incentive straight hourly pay methods. The comparison is made on actual labor costs and man hours of work involved during the incentive period and before incentives were in effect. The specific calculations were made per square foot of housing produced, a unit which would remain constant during both periods. The periods of time selected were chosen to cover both high and low production.

Savings

When the figures were tabulated, it became apparent that the man hour saving was considerably larger than the reduction of cost, a 2.7 to 1 ratio, to be exact. This may be explained by the fact that there has been an actual increase in base pay as well as an effective increase in overall pay. Even with this increase in effective wage rates, the cost reduction amounted to approximately 10 per cent. This is an impressive saving when considered in the light of increased individual wages. It should be kept in mind that this 10 per cent saving is in direct labor costs only. There was also a 27 per cent saving in man hours. This means a large saving in overhead.

The savings indicated by this analysis were due to both the incentive system and better methods. A number of ways were tried to separate the savings due to each cause but no reliable method was found. However, such a separation would be only of academic interest, since the two always go hand in hand. The setting up of incentive pay requires that methods be standardized; and proper application of method analysis will yield not only a standard method but probably a very efficient one.

Benefits

It should be brought out that although effective pay is increased under an incentive plan, the pay is for actual units of work done. It is something like the salesman's guarantee plus, that is, management says that a man will get so much an hour, but over a certain number of base units of production he will be paid so much per unit. In this way, management is able to determine how much they can afford to pay for a unit and then this amount is stabilized for any production. Compare this to the straight hourly pay method where a man may or may not produce enough to justify his hourly wage. The only control of costs management has in the hourly pay method is the "pushing" of the foremen and this has its obvious limitations.

As was stated in the beginning, the Knox Corporation and their employees are well satisfied with the results of incentive pay. Incentives have brought about many problems, some very difficult to resolve, but the efforts made on the part of both management and the men have been well worth the trouble for those efforts have been rewarded with a good, efficient organization.

The incentive system employed at Knox Corporation was instituted by Serge A. Birn, Consulting Management Engineers of Louisville, Kentucky, whose expert analysis and engineering contributed greatly to the success of the program.

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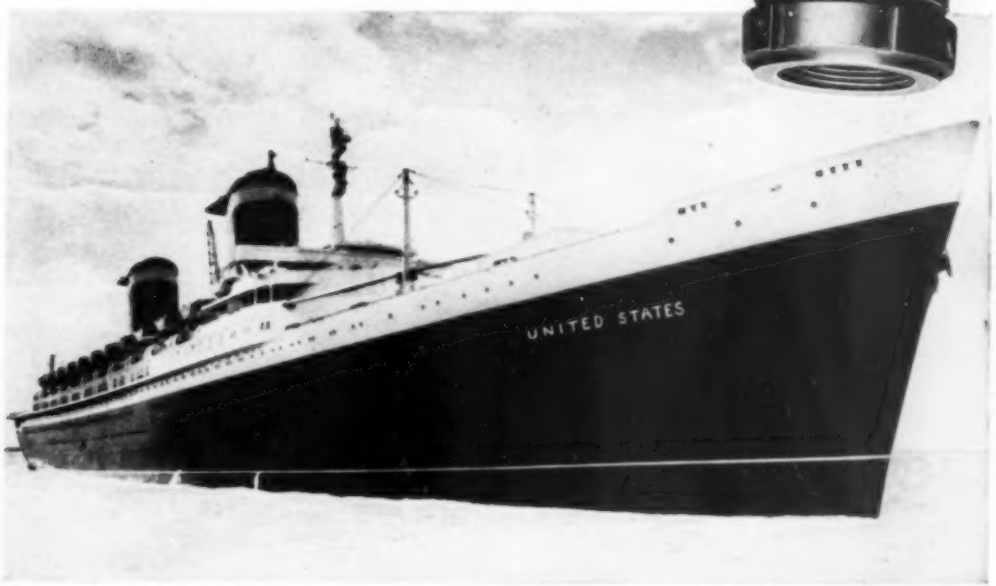
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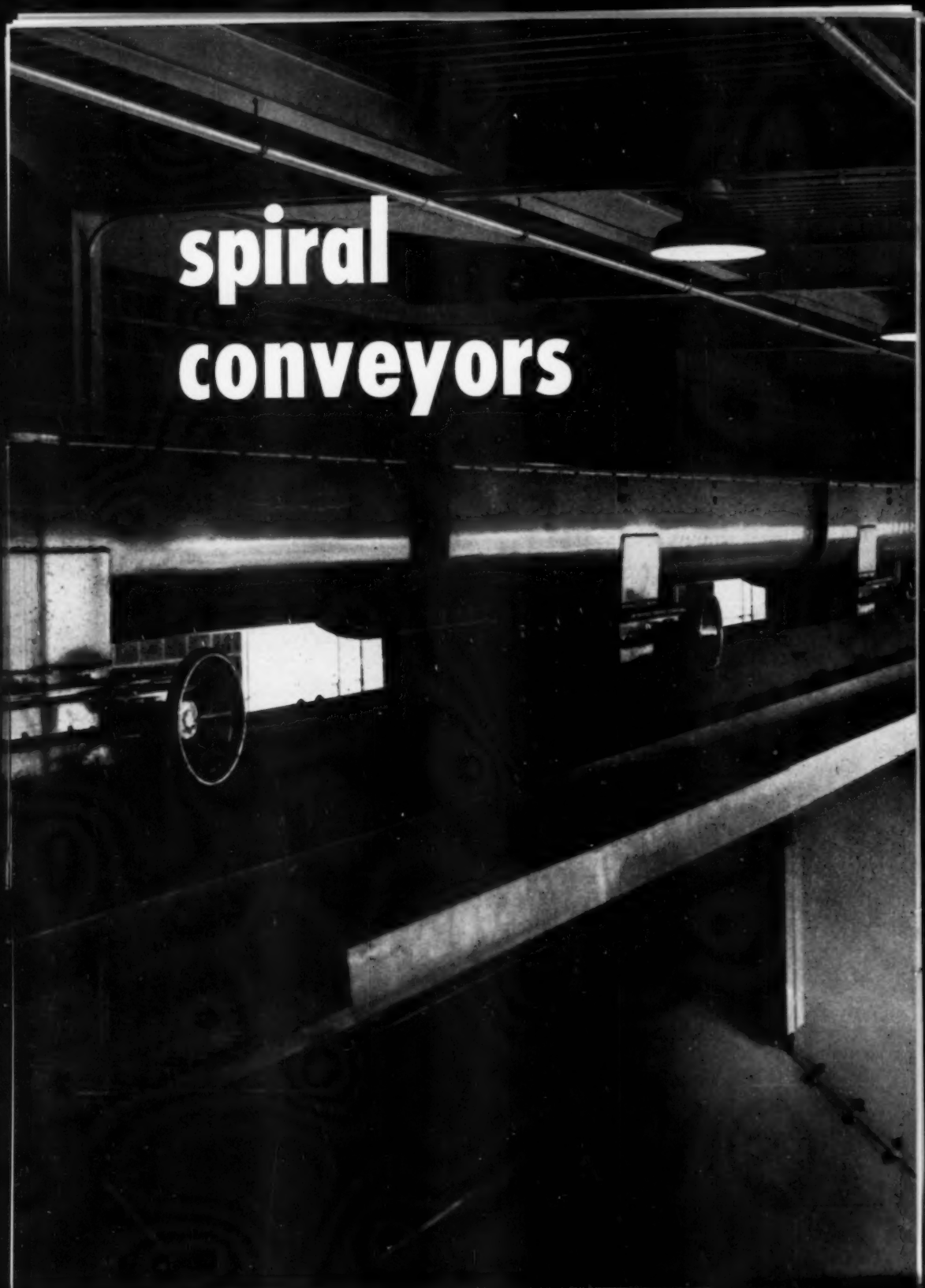
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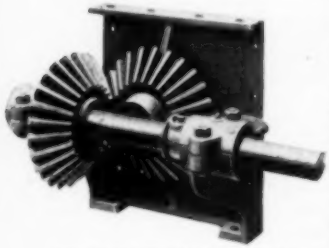
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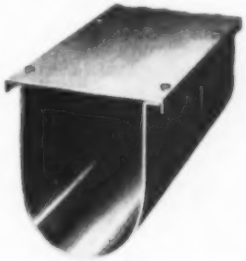
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Watch That Smoke Stack

By I. E. CUSHING, Design Engineer, Abco Furnaces, Fort Worth, Texas

Your plant is no larger than the smoke stack. Give correct stack height and diameter preference rating in its importance to successful plant operation.

IN the early days when capacities and pressures were low, little attention was given to real furnace design. Operators generally considered the stack or chimney a necessary evil and its principal function was seemingly to prevent a smoke nuisance.

Of course, the engineers knew better, but many seemed somewhat reluctant to give the smoke stack its true value. Today, for the most part, stack or chimney size and height is recognized as a very important part of the overall plant design. However, there are still many small industrial plant owners, as well as some larger operations, that still do not seem to fully realize the true function of the chimney and its very fundamental relationship to the successful operation of the power units.

In any industrial plant using steam boilers for power, the power unit is actually of no more capacity than the stack. Unless properly designed, the stack may be the limiting factor in plant capacity.

Load Requirements

For many years, coal was considered as the standard fuel (and still is to a very large degree). Also most industries in the early days depended to a large extent on the boiler manufacturing companies to furnish not only the boilers but also the stack or stacks. This was especially true where small H.R.T. boilers were used with individual stacks. The fuel (coal) was burned on grates and the stacks were so figured as to allow for a reasonable draft loss through the fuel bed and boiler tubes, a reasonably sized breeching and a coal of average heat content.

Under these conditions and with most H.R.T. boilers required to operate at no more than rating, a fairly successful operation was to be expected. Now, when boilers with stacks designed for the above mentioned conditions are operated with oil or natural gas as fuel, a much heavier load can be carried with relative ease. On the other hand when boilers with stacks designed as mentioned above were sold to sawmills where the fuel was to be hogged fuel of approximately 50 per cent moisture content as fired, the operating conditions would be entirely different.

Stack Performance With Different Fuels

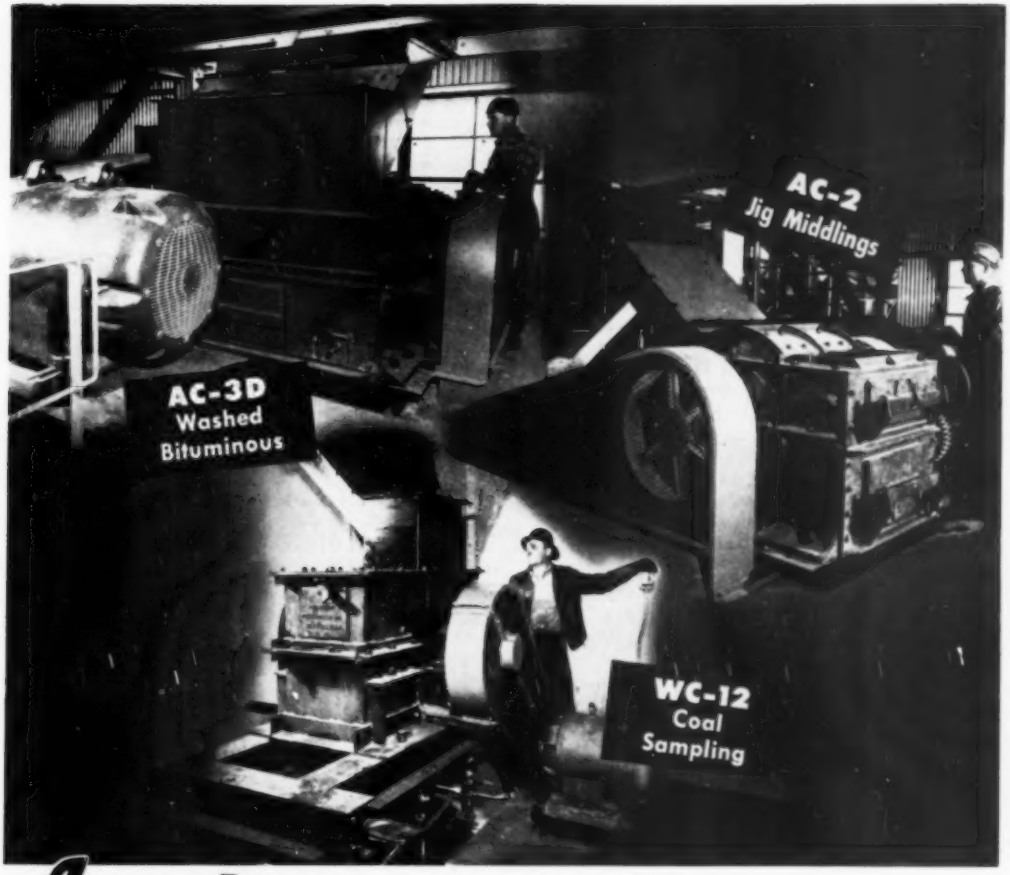
To illustrate how an assumption, that a stack of diameter and height which was ample under one operating condition, would be good for the same boiler and steam load under any other operating condition may have very serious effects, we will take a specific steam load and show the difference in the work the stack or chimney has to perform with different fuels.

Let us assume that the customer writes to some boiler company and gives them an order for a 150 hp H.R.T. boiler, complete with grates and stack, and no other information. Strange as it may seem, this is still the way a good many boiler orders are given. In the not too distant past, it was the accepted method in ordering practically all H.R.T. boilers. Without going into the details of the combustion calculations involved, let us use checked figures developed from actual tests of various fuels.

First, let us consider **a good grade of coal** within the order of 14,000 Btu heat value per pound, and an ultimate analysis consistent with such a heat value. Let us assume it is burned in a reasonably efficient furnace under at least good average conditions with, say, 20 per cent excess air and exit gas temperature of about 600 F (which would be good for an H.R.T. boiler). Under these conditions, each pound of coal would evaporate about 10.5 pounds of water from and at 212 F and each pound of coal burned would produce in the order of 16 pounds of products of combustion.

To develop our customer's 150 hp under the above mentioned conditions, it would be necessary to burn 493 pounds of coal per hour, which in turn would produce 7,888 pounds of products of combustion.

Consider **a natural gas** as the fuel to produce the desired horsepower with the same boiler. An average natural gas of the Southwest will weigh .046 pounds per cubic foot with a heat value of around 1,000 Btu per cubic foot or 21,700 Btu per pound. To develop



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The wisdom of this choice has been proved again and again by past performers—American Crushers are consistently crushing coal at a total cost of LESS THAN 1 CENT PER TON (including interest on original investment, depreciation, replacement parts and power).

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150 hp with this gas as fuel under the same operating conditions under which the coal was burned, will require 330 pounds of gas per hour, which in turn will produce 6630 pounds of products of combustion.

Consider **a waste fuel** typical of the kind many sawmills have—a hogged fuel of approximately 50 per cent moisture as fired, and having a heat value of 9,000 Btu per pound on a dry basis. Due to the inherent qualities of this fuel, the overall efficiency of the operation cannot be as high as with such fuels as coal and gas. It is not practical to burn this type of fuel with less than about 30 per cent excess air.

To produce the necessary steam for 150 hp with this wood waste fuel, it will be necessary to burn at least 2000 pounds per hour, which will make approximately 10,000 pounds per hour of products of combustion and water vapor. Since each of these different quantities of products of combustion or flue gases would pass through the same boiler and stack, it is quite evident that the work required of the stack will be considerably different in each case.

From the law governing the flow of gases in round ducts, the friction loss for all practical purposes varies as the square of the velocity when all other conditions remain the same. The stack for the 150 hp boiler was designed to take care of the draft loss through the boiler due to burning 493 pounds of coal per hour, from which the products of combustion are 7,888 pounds per hour. This same stack would therefore have a 60 per cent greater draft loss to take care of when the 150 hp load was being carried by burning the 2,000 pounds per hour of wood waste fuel, from which there would be 10,000 pounds products of combustion per hour, due to the increased resistance to the gas flow through the boiler tubes alone.

If the increased resistance through the furnace and boiler setting, the breeching and stack itself due to this increased volume of gases are considered in addition to the increased resistance through the boiler, the stack may well have double the work to do with the wood waste fuel as compared to its work when the boiler is producing the 150 hp load with coal as fuel.

FROM this interesting stack performance data based on different fuels, the importance of the stack in relation to good boiler and furnace operation is quite evident. No plant owner, whatever the size of his plant might be, should consider the boiler plant without giving the stack high preference rating in its importance to successful operation.

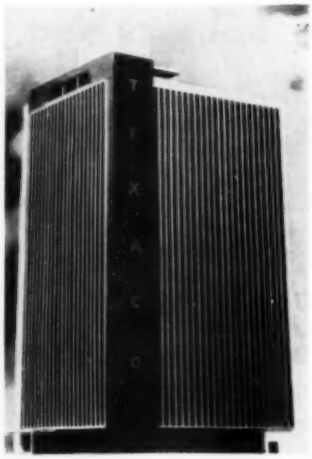
This is where the owners of many plants make a very serious mistake. Layouts and studies will be made for the handling of materials. Thousands of dollars will be put into new and modern equipment. New boilers and prime movers will be installed—all with high expectations of improved product and increased production.

Then, "a stack we have on hand" or "so-and-so has a second-hand stack that will do," or "look around, we'll find a stack somewhere that we can use." This is the consideration given to stack selection and the plant goes into operation. Production is not as expected, lost time develops because of low steam pressure and no one is happy, especially the owner—all because the stack is too small.

Select the stack with the same careful consideration you would any high priced important piece of equipment. Consult an engineer, one who can show you the facts and figures as to why you need a certain size stack to do your job. Remember that your plant is no larger than the smoke stack, and be sure it has diameter and height enough to do what you expect of it.

Texas Company's Division Headquarters—New Orleans

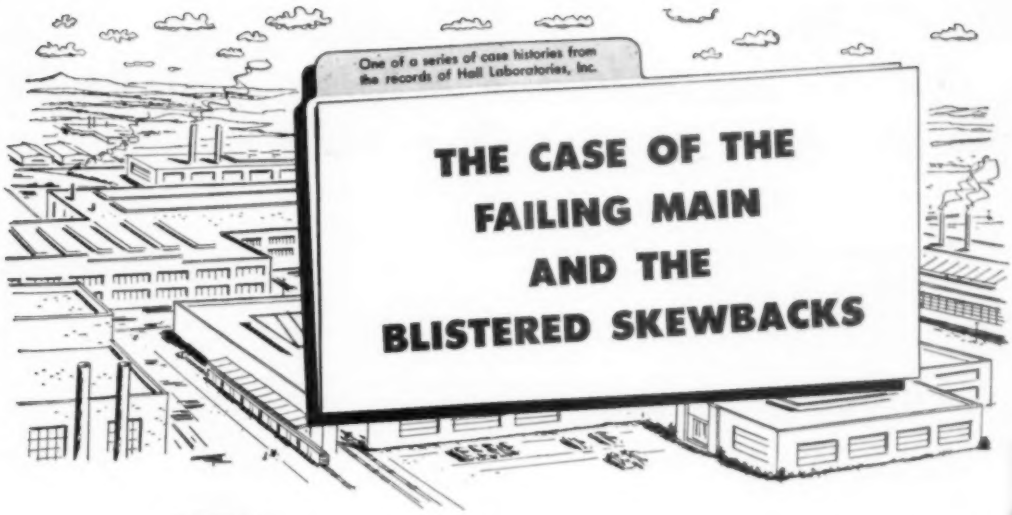
New division headquarters for the Texas Company are expected to be ready for occupancy by December. The new 17-story building, 85 ft wide by 114 ft long, is being erected at the corner of Canal and Marais Streets in New Orleans.

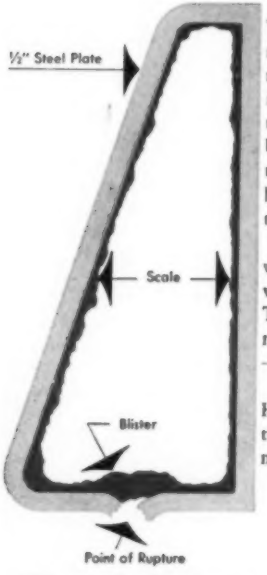


An extremely large tonnage of the structural shapes which have been used to fabricate the beams and girders was rolled on the mills of the Tennessee Coal and Iron Division, United States Steel Company, at its Fairfield (Ala.) Steel Works. Fabrication work was handled in the Ingalls Iron Works Company's Birmingham plant, and fabricated sections were then shipped to New Orleans for assembly and erection.

Building was designed by Architect Claude E. Hooton of New Orleans and Houston. Haase Construction Company, Inc., of New Orleans is the general contractor.

This new 17 story office building will serve as division headquarters for the sales and producing departments of the Texas Company in New Orleans. It will be among the tallest buildings in the country with all-welded framework. Structural members were joined by arc welding, thus entirely eliminating the use of rivets.





Failure of one of these water-cooled skewbacks supporting the roof of a furnace means lost production and interrupted work schedules. Threshold treatment stopped deposition of scale, eliminated resultant overheating and failure.

The water system in a Western copper refinery consists of almost 2 miles of buried mains and branch lines, of sizes from 16 inches down to 4 inches, and additional thousands of feet of smaller service lines. Uninterrupted supply of water throughout this system is essential for cooling skewbacks, furnace jackets, pads and doors in the anode and wire bar furnaces.

For years this refinery struggled with a water problem—scale laid down by the water wherever it cooled a hot surface. Then, suddenly, the failure of a 6-inch main announced a second critical problem—corrosion.

The double trouble was placed before Hall Laboratories, who recommended threshold treatment with a few parts per million of Calgon to solve in one stroke the difficulties with both scale and corrosion. Since August of 1946, this treatment has not only inhibited internal corrosion and prevented deposition of new scale, but has also cleaned out old accumulations of scale and rust.

In contrast to the earlier history of difficulties, no failure has occurred since threshold treatment was started under the supervision of a Hall engineer. Rupture of a single skewback, failure of one branch line would, in all likelihood, cost many times the yearly charges for treatment.

Whatever your water supply problems are, Hall engineers are ready to help solve them. Their experience is wide and varied, and proof of their accomplishments is in the long lists of satisfied users of the services offered by Hall Laboratories.

HALL LABORATORIES, INC.

(A Subsidiary of Hagan Corporation)

HALL PLANT WIDE WATER SERVICE

Consultants on Procurement, Treatment, Usage and Disposal of Industrial Water

Hall Laboratories, Inc., Hagan Building, Pittsburgh 30, Pa.

Please send me your bulletin: Let's Consider Your *Whole* Water Problem.

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SP-7



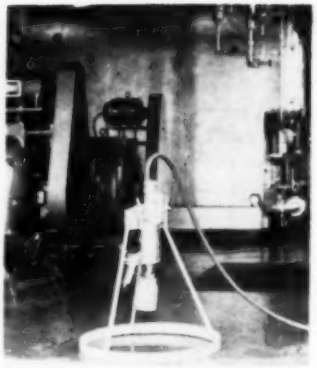
HELPING the *MAN-IN-THE-PLANT*

ideas . . . tools . . . methods . . . devices

Dehumidifier Stand For Spray Gun Unit

THE air-operated spray gun is widely used in plant maintenance work, with the usual practice dictating that the dehumidifier be attached at the nearest air outlet, and the air conveyed to the gun through a hose.

One engineer found that there was sufficient condensation of moisture in the hose to affect the appearance of his paint coat, and he rigged up a stand, or support, to which the dehumidifier could be bolted. This stand, heavy enough to remain rigid on its circular base, could be readily moved by the painter, and required only a minimum length of hose between drier unit and gun. — *Elton Sterrett, Houston, Texas.*



The three sloping braces which carry the drier unit also serve as storage space for the coiled hose when not in use, a hook at the bottom of the dehumidifier also allows the gun to be suspended there, so as to keep the entire outfit as compact as possible for between-jobs storage.

Capacity Increased—Labor Costs Reduced In Metal Cutting Equipment Modifications

DUE to increased production schedules we were faced with the problem of increasing the cutting capacity of our Cam-o-graphs. The Cam-o-graphs, a product of National Cylinder Gas Company, were originally equipped with three cutting heads. The first improvement was to install a fourth cutting head on each unit. This enabled us to have four cutting tips, cutting at one time instead of three.

Production up 200 per cent; unit labor cost reduced 50 per cent on this Cam-o-graph at R. G. LeTourneau, Longview, Texas.



Additional capacity was still needed. We then installed a larger oxygen line to the Cam-o-graph to give us sufficient oxygen pressure. A manifold, made from ¾ in. steel tubing was then built and installed with eight sets of hoses leading to the four cutting heads. Four adjustable slides were built and each was installed on a cutting head. Each slide is equipped to hold two cutting torches.

Instead of the original three cutting heads, with a cutting torch on each, we now can set up the cams with as many as eight torches cutting at once, with the resultant reduction in standard cutting time of 266 per cent. Of course, due to the size of the parts and the width of the material, it is not always possible to use eight torches. But where material and part size permit, these savings can be realized.

This work improvement method was reported by *B. E. King*, Maintenance General Foreman and *C. Melvin Brooking*, Chief Industrial Engineer, *R. G. LeTourneau, Inc., Longview, Tex.*

FREE



From Western Precipitation—the organization that pioneered the commercial application of Cottrell Precipitation...

IF YOU ARE ENGAGED in any phase of industry where the recovery of dusts, fumes, fly ash, mists, fogs or other suspensions from gases is a problem, you will find this booklet on the COTTRELL Electrical Precipitator helpful and informative.

Western Precipitation pioneered and installed the first commercial application of the well-known COTTRELL Electric Precipitator—Dr. Cottrell, the inventor, being a member of the company. And for more than 42 years Western Precipitation has consistently led in developing new COTTRELL advancements and techniques for recovering suspensions from gases, both wet and dry.

This 28 page booklet summarizes many of the basic facts you should know about modern COTTRELL Precipitators—the various types available, how they operate, principal types of electrode systems and rectifiers, shell constructions, etc. As long as the supply lasts, a free copy will be sent you on request to our nearest office. Ask for Bulletin No. C 103.

28 PAGES
of helpful facts to know about
COTTRELL ELECTRICAL PRECIPITATORS



Packed with helpful COTTRELL Information!

This Western Precipitation Cottrell booklet is designed to answer questions of design engineers, plant engineers and others interested in applying Precipitators to the recovery of industrial dusts and mists. It discusses such subjects as...

- **Basic types of Cottrell Electric Precipitators.**
- **Principal parts of a Cottrell Precipitator.**
- **Mechanical and Electronic Rectifiers.**
- **Various types of Collecting Electrodes (rod curtains, corrugated plates, dual plates, pocket electrodes, etc.).**
- **Removal of Collected Material.**
- **Factors in Shell Construction (steel, concrete, brick, etc.).**
- **Operating Efficiencies and the Effect of Various Factors on Performance.**

...and many other basic Cottrell facts. Write for your free copy of Bulletin C103 today while supplies are adequate!

Western Precipitation is not affiliated with any other company in the field of electrical precipitation except its wholly owned subsidiaries, International Precipitation Corporation and the Precipitation Company of Canada, Ltd. Whether you are now contemplating the installation of a Cottrell Electrical Precipitator, or may be interested in such an installation at a future date, we can and will serve you in any part of the United States or other countries.

NOW SELLING

COTTRELL Precipitators
MULTICLONE Collectors
TURBULAIRE Spray Dryers

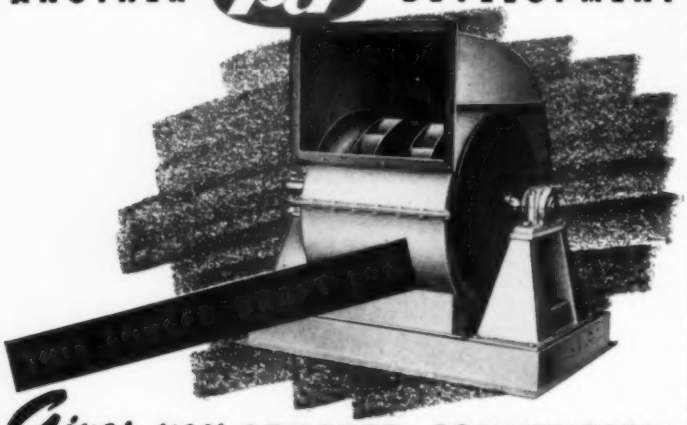
...in all parts of the U.S.A. and foreign countries.

WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

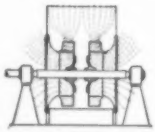
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ANOTHER pd DEVELOPMENT

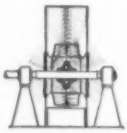


Gives you GREATER CONVERSION

OF VELOCITY PRESSURE TO STATIC PRESSURE



How P-D split wheel assists diffusion—aids distribution throughout the fan.



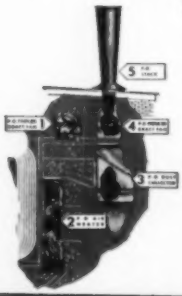
Conventional double wheel with common disc produces concentration, results in poor diffusion.

Performance ratings of the Prat-Daniel F-D Fan are established according to the Standard Test Codes adopted by N.A.F.M. and the A.S.H.V.E.

Design characteristics provide unusually high conversion of Velocity Pressure to Static Pressure. This is accomplished by streamlined inlet cones that are larger in proportion to the wheel than are usually found in forced draft fans. The unusual depth of the cones provide a wider housing than would customarily be used, increasing the space available for diffusion. Precisely fashioned backward curved blades provide a nearly perfect aerodynamic flow across both leading and trailing edges. Double wheel fans are spaced apart to permit four way diffusion of air, further contributing to this conversion. Peak efficiency and horsepower curves fall well within normal fan selection range, offering the optimum in maximum efficiency and non-overloading characteristics.

These are all carefully researched features that have made the Prat-Daniel F-D Fan a highly efficient apparatus. Check these features before you decide on your next fan. Write for catalog No. 300 today.





UNIT RESPONSIBILITY

The Thermix Corp., project engineers for the Prat-Daniel Corp., offer all components required for the handling of air and gas: (1) P-D Forced Draft Fans; (2) P-D Air Pre-Heaters; (3) P-D Tubular Dust Collectors; (4) P-D Induced Draft Fans; and (5) P-D Fan Stacks. This unit responsibility, by a well known firm, relieves the engineer of the necessity of integrating equipment from various sources into the over-all project.

Sales and Project Engineers

THE THERMIX CORPORATION

GREENWICH, CONN.

Canadian Affiliates: T. C. CHOWN, LTD.
1440 St. Catherine St. W., Montreal 25, Quebec
50 Abell St., Toronto 3, Ontario

Designers and Manufacturers

PRAT-DANIEL CORPORATION

SOUTH NORWALK, CONN.

Don't Throw Away The Instructions

MOST manufacturers are very careful about sending complete instructions with their products in order that there will be no failure in operation and that the product will not be ruined because of unintelligent application.

A bad habit possessed by many buyers, however, is to unpack an item hurriedly and throw the instructions away with the packing. Such thoughtlessness can lead to a lot of unnecessary trouble.

An incident that happened recently in an isolated industrial plant serves to illustrate the importance of reading the manufacturer's instructions—no matter how simple.

The machine and parts were covered by a blue lacquer when received at the plant. The engineer couldn't put the parts together because of the thickness of the lacquer, and he couldn't get the lacquer off. He tried scraping, washing with hot water and soap, gasoline, kerosene, and everything he had on hand, but the lacquer wouldn't come off. So he telegraphed the manufacturer and received a short and snappy reply which said, "The instruction book tells you to use alcohol." Alcohol removed the lacquer with ease.

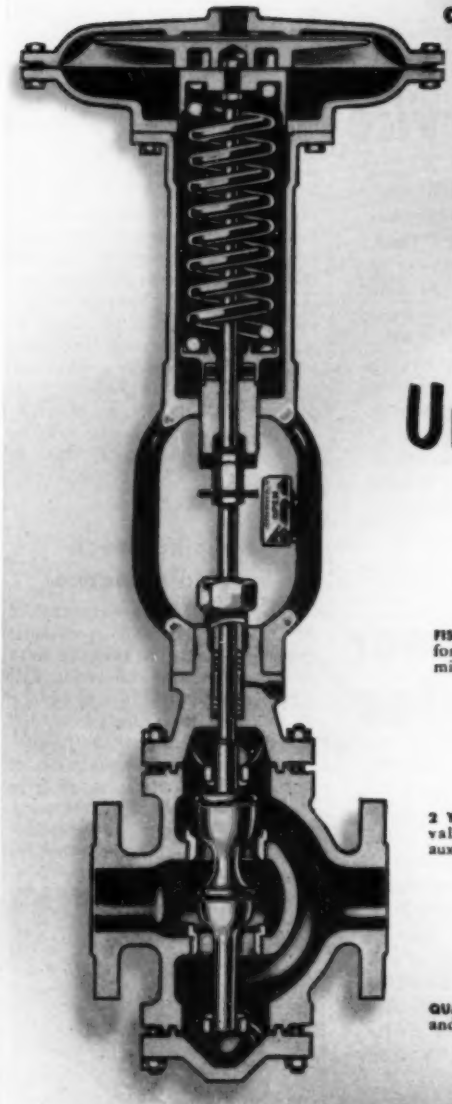
Things are done differently right along. They are done BETTER this year than last. Next year they will be done better than this year. And so on without end. It therefore behooves us to be careful about throwing printed matter of this kind away. Always scan it with care, at least, even though you don't read every word. Be sure that you are acquainted with the "latest and best" method of applying the part or product, no matter how simple it may seem. Thousands of dollars worth of equipment is ruined every day because of misapplication. The reason for the misapplication is usually the know-it-all spirit in which too many buyers receive shipments and install them.

Tomorrow, very likely, some of us will turn around and carelessly throw away directions in the same old way without thinking. It is done mechanically. It is a habit. It is a bad habit.

Exclusive features of design plus quality controlled materials and workmanship are the reasons

FISHER®

Diaphragm Motor Valves are Universally Preferred







FISHER ALLOY SPRINGS are tested for load tolerances of plus or minus 2½%.



VARIETY OF BODY TYPES and materials—iron, steel, bronze, alloys, single and double seated, angle and globe.



2 YOKE MOUNTING PADS for valve positioner and other auxiliary equipment.



WIDE CHOICE OF INNER VALVES to provide desired flow characteristics.

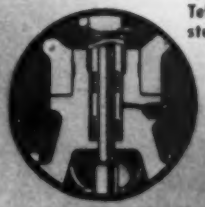


QUALITY CONTROLLED materials and workmanship.



WALL SECTIONS conform with ASA fittings code.

Fisher offers the most versatile and complete line of Diaphragm Motor Valves—manufactured to handle pressure conditions up to 6,000 pounds. Available in metals for highly corrosive service and alloys for high temperature work. They are built for your specific requirements.



VERSATILE! ECONOMICAL!

Teflon V-Ring Packing, requiring no lubrication, is standard on all Fisher Diaphragm Motor Valves

Dual Teflon packing also available. 2 sets of packing separated with bleed area where purge zone is desired. Positively prevents outbound leakage—or inbound leakage under vacuum service. For dangerous toxic, corrosive, etc. applications.

FISHER

FISHER GOVERNOR COMPANY • Marshalltown, Iowa

LEADS THE INDUSTRY IN RESEARCH FOR BETTER PRESSURE CONTROL

Automatic sight feed lubricator for pressure service



● On-and-off control is entirely automatic—when pressure is on, lubrication starts. When pressure is shut off, lubrication stops. No valve to operate—or to forget. When operating the oil flow remains constant, and is accurately regulated by a knurled cap. Knurled filler plug is easily made tight by hand. No tools needed. Here is ideal lubrication for tube cleaners, soot blowers, or other steam or air-driven equipment. Details sent on request.

ELLIOTT pressure type LUBRICATOR

Trigger-controlled cleaner for small straight tubes



● This is the tried and proven Lagonda suspension type cleaner, redesigned for increased power and instant control. Two ball-type bearings, handling thrust both ways, let all the power through to the drill or cutter. Controlling trigger located at the base of the handle gives instant regulation from wide open to shut-off. It controls water supply as well as pressure. The air or steam-driven cleaner is illustrated. Also available with electric motor drive, with similar convenient control. Bulletin sent on request.

LAGONDA suspension type CLEANER

Y2-14

ELLIOTT COMPANY
LAGONDA DIVISION · SPRINGFIELD, OHIO
Plants at: Jeannette, Pa. • Ridgway, Pa. • Ampere, N. J. • Springfield, O. • Newark, N. J.
DISTRICT OFFICES IN PRINCIPAL CITIES

Turnbuckle Rod

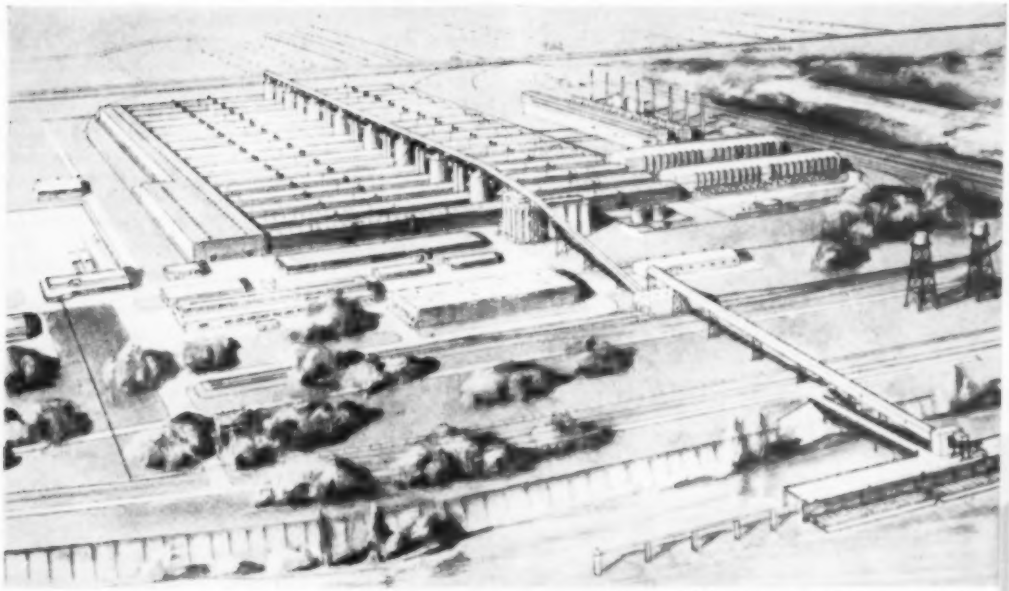
WHERE a right and left hand threaded rod, such as is used with adjustable clevises, must be made, time can be saved and the job simplified, and the rod improved, by threading a suitable length of rod with right hand threads and a similar length with left hand threads. Then the two rod sections are joined into a hexagon nut at the center and the joint brazed solid. Of course, the left threaded section will not screw into the standard nut. Threads on this end are ground off to allow inserting and brazing in place. The hexagon nut then serves as a means of turning the rod with a wrench when adjusting the clevis span, eliminating the need for jamming nuts on the rod as turning means.—*Thomas Trail, Maryland.*

Keeping Stock For Maintenance

A JUMBO-SIZE assortment of maintenance and operational supplies is needed to keep the plant of Tube Turns, Inc., Louisville, Ky., running smoothly. In the custody of General Stores are 20,000 different items that represent a sizeable investment. The quantities of these individual items range from one dozen to tens of thousands. They include such things as featherweight cotter pins that the eye



There are an average of 650 withdrawals a day from General Stores of Tube Turns, Inc., Louisville, Ky., and the tool cribs under its management. All are made by properly signed requisitions. The present operating plan was introduced in 1943 and has been polished to near perfection.



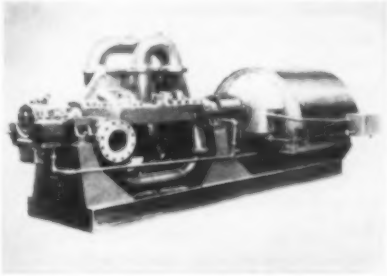
KAISER ALUMINUM AND CHEMICAL CORPORATION'S new 400,000,000 pound-a-year, $150,000,000 aluminum reduction plant at Chalmette, La., designed and built by Kaiser Engineers, is the largest plant of its kind in the U. S. The plant—where production began in December, 1951—uses 19 Worthington boiler-feed pumps and other Worthington equipment including thirty 9,300 square-foot condensers, and fifteen 250,000 pound-per-hour deaerators, 2 steam turbines and numerous circulating pumps.

Power plant at largest aluminum reduction plant to use Worthington pumps, condensers, deaerators

It takes plenty of electric power to produce 400,000,000 pounds of aluminum in a year. And that's what they're doing at the new Kaiser Aluminum plant at Chalmette, La.—largest aluminum reduction plant in the U. S.

Kaiser joins many other top companies in choosing Worthington boiler-feed pumps as well as other key equipment for their new plant. Such choices arise out of an insistence for equipment that's engineered for maximum performance.

Worthington engineering produces boiler-feed pumps of the most advanced design in the field, made from specially selected metals. Each pump is exactly *right* for the pressure and temperature with which it is to perform. Over 110 years of Worthington experience in building pumping equipment go into making this a certainty. Worthington Corporation, formerly Worthington Pump & Machinery Corporation, Centrifugal Pump Division, Harrison, New Jersey. C-2.4



19 WORTHINGTON 250,000 LBS PER HR BOILER-FEED PUMPS at new Kaiser plant, handle feedwater at 257 F against a discharge pressure of 1,030 psig. Pumps are axial-balanced, volute type centrifugals. Two, similar to one illustrated, are driven by Worthington 450-hp steam turbines.



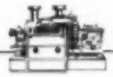
For Boiler Feed Service. Capacities to 1,500 GPM; Heads to 1,000 feet.



For Hotwell, Condensate, Chilled Water Service. Capacities to 1,400 GPM. Heads to 650 feet.



For Water Works, Circulation, Drainage, General Service. Capacities to 135,000 GPM; Heads to 400 feet.



For Boiler Feed Service. Capacities to 3,000 GPM; Heads to 7,000 feet.

The World's Broadest Line Assures You the Right Pump for Every Job

WORTHINGTON

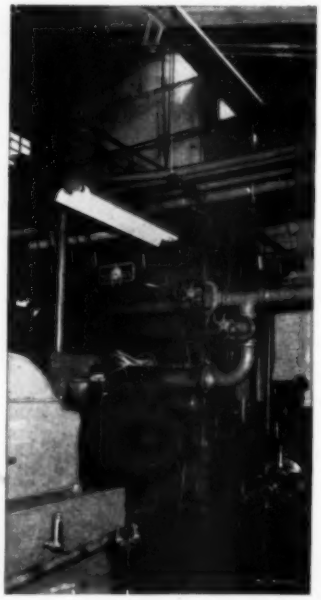
Centrifugal Pumps

You Get Trustworthy Liquid or Gas Cooling With Great Cooling Water Savings from the NIAGARA AERO HEAT EXCHANGER

● You can cool air, gas, water, oils, chemicals, electric and power and process equipment, engines, mechanical processes with lower cost and really accurate control of temperature with the Niagara Aero Heat Exchanger.

You are assured of uniform, constant production and quality from any process . . . steady, reliable operation . . . lower cost for more dependable cooling. You can have closed system cooling with freedom from scale, dirt, corrosion and maintenance troubles. You can accurately cool more than one type of liquid with one machine.

The Niagara Aero Heat Exchanger uses atmospheric air to cool liquids and gases by evaporative cooling. You can remove heat at the rate of input to keep accurate control of gas or liquid temperature. You can put heat back into the system to save the losses of a "warm-up" period or to equalize the effect of load variations.



Great savings in cooling water and savings in piping, pumping and power return the cost to you quickly. The Niagara Aero Heat Exchanger can save you approximately 95% of your cooling water cost. Write for Bulletin 96.

NIAGARA BLOWER COMPANY

Over 35 Years Service in Industrial Air Engineering

Dept. SP, 405 Lexington Ave. **New York 17, N. Y.**

Experienced District Engineers in all Principal Cities of U. S. and Canada

scarcely catches at first glance to components of forging equipment that tip the scales at 8000 lb, and are transported by bridge-type traveling cranes.

A running inventory of each item is kept by means of a simplified card system that's both accurate and labor-saving. On each item's card are listed its description, specifications, vendor's name, withdrawals, and the maximum and minimum quantities required. A 90-day supply of any item is usually considered the minimum quantity needed.

Special Abrasive Stone Solves Spindle Problem

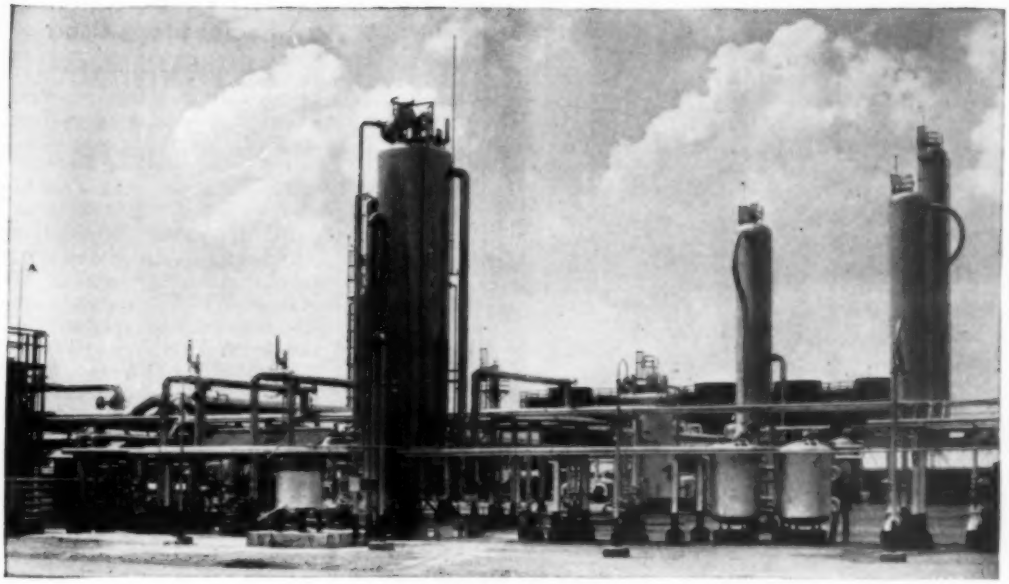
THE efficiency of Ben Pearson's cotton picking machines in Pine Bluff, Arkansas, was dropping off. Investigation disclosed that the continual abrasive action of the cotton was gradually wearing away the normally rough surface condition of the steel spindles. Operating efficiency was definitely impaired.

Mr. Pearson devised an ingenious rig (illustrated) using abrasive stones to roughen up the steel teeth, and ordered specially designed stones from the Bay State Abrasive Products Co., of Westboro, Mass.

The abrasive stones were made to specifications in the proper grade to roughen the spindles just enough to let them keep pulling the cotton off at top speed. Since the stone holding device permitted the use of the cotton picking machine's own power, the "roughening" operation was efficient and easy.



Here's a close-up of the specially designed rig. Abrasive stones are a product of the *Bay State Abrasive Products Co.*



NORTH COWDEN GASOLINE PLANT near Odessa, Texas, operated by Stanolind Oil and Gas Company. Here Worthington Water Softeners protect boilers from scale-forming deposits.

Worthington softeners protect this plant's boilers 10 ways

In this case, it's a hot-process softener to remove scale-forming deposits from boiler feedwater.

Let's examine this gasoline plant installation and see how it gives boilers "maximum" protection:

1. *Feed water is softened* by a hot-lime soda system.
2. *Selective deaeration* for operation on make-up only, condensate only, or both.
3. *Non-scaling direct-contact vent condenser* heats and vents treated make-up.
4. *Tubular vent condenser vents condensate.*
5. *Oxygen contamination of feedwater avoided* by last-step deaeration.
6. *Stainless steel deaerating elements.*
7. *Uniform and efficient deaeration* during wide load swings.
8. *Filter backwashing* with clean, hot, chemically inert water without velocity change through the softening zone.
9. *Proportionate sludge removal.*
10. *Uniformly proportionate chemical feed.*

Before you buy, investigate Worthington Water Softening Systems thoroughly. Tell us the service conditions, and get our recommendations in terms of dollars and benefits. Write Worthington Corporation, formerly Worthington Pump and Machinery Corporation, Water Treating Section, Harrison, N. J.

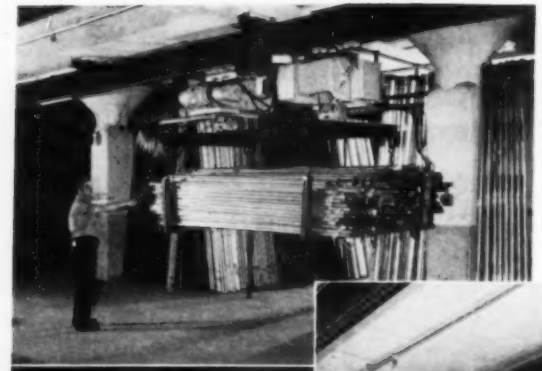
J.1.4



Worthington Makes More of the Equipment for ALL Types of Water Conditioning Systems

WORTHINGTON

Water Conditioning



Two hoists connected with an American Mono-Tractor make up the special carrier for finger-tip transfer of heavy load.



Finger-Tip Handling *Speeds Delivery* TO GraybaR CUSTOMERS

Carrier runs on shielded RailMaster track over loading dock.

From warehouse stock to delivery truck, heavy loads are quickly transferred by finger-tip control with this American MonoRail Overhead Handling System.

In addition to speeding up loading and unloading time, this simple inexpensive system cut handling labor, improved space utilization, reduced material damage, and bettered working conditions.

It can be done in your plant and an American MonoRail engineer will gladly tell you how.

THE AMERICAN MONORAIL COMPANY

13105 ATHENS AVENUE • CLEVELAND 7, OHIO

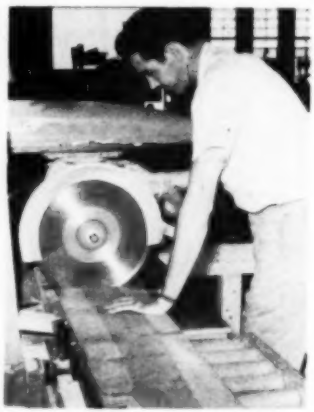
Special Stops Used on Cut-Off Saws

SPECIAL stops are being used on cut-off saws in the wood shop at Temco Aircraft Corporation, Dallas, Texas, to reduce the time required for making set-ups and to eliminate the use of hand clamps as stops.

The stops were designed by *C. C. Johnson*, wood shop employee, to expedite crating operations, but other adaptations are possible. Previous to the development of the new stops, hand clamps were used, making it necessary to remove the stops each time the set-up was changed. In cutting crate sections, at least four and often six set-ups were necessary.

Operation

Under the new method, a length of angle iron is secured along the back of the saw table to serve as a track for the stops. The base for the stops is "U" shaped and slides on the angle iron. A hand screw locks the base in any desired position. Two stops are hinged to each base, the distance between the two being twice the thickness of the crating stock being used. The stop not in use is simply turned back out of the way, thus making it possible to cut the top, bottom and sides of crates and boxes with one set-up. If



C. C. Johnson of Temco's Wood Shop, demonstrating use of the special stops. As the company often uses as much as 15,000 board feet of crating material in a single week, the stops have effected a considerable savings in set-up time.

UNDERWRITERS' LABORATORIES

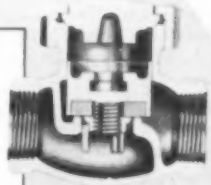
UL approved

VALVES FOR LP-GAS SERVICE

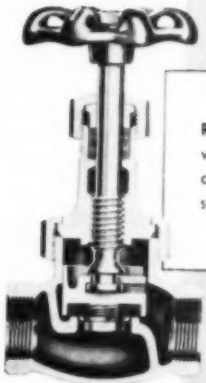


No. 92LPG Bronze
Angle Valve

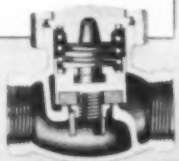
Resilient seat type valves, with synthetic rubber-like discs and specially treated stem packing.



No. 93LPG Bronze
Check Valve — Regular



No. 91LPG Bronze
Globe Valve

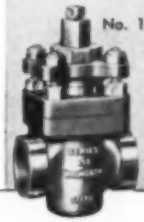


No. 88LPG Bronze
Check Valve — Spring Loaded

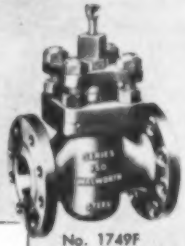


Metal-to-metal taper seat type split wedge gate valve, with specially treated stem packing. Metal-to-metal seat valves are limited by UL to branch or by-pass lines where a positive shut-off is not essential.

No. 29LPG Bronze Gate Valve

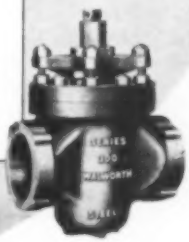


No. 1750

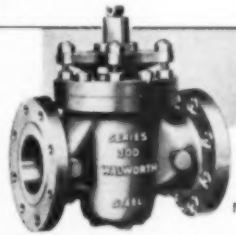


No. 1749F

Steel lubricated plug valves, wrench operated, having screwed or flanged ends and proper lubricant for LP-Gas service.



No. 1760



No. 1760F

Underwriters' Laboratories Pamphlet No. 58 lists requirements for LP-Gas service. Valves are intended for use where working pressures do not exceed 250 psi. — the maximum stop-to-discharge pressure setting of the relief valves on the LP-Gas systems on which they are to be used. This pressure does not necessarily match the manufacturers WOG rating. The Walworth valves illustrated here meet the UL requirements within the set limits. Your local distributor will be glad to furnish complete information, or write to:

WALWORTH

valves • fittings • pipe wrenches

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DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

it is so desired, a set-up may be retained indefinitely by turning both stops back so that there is no interference with other operations.

Substations Effect Savings in N.C. Mill

SAVINGS of approximately 25 per cent on motor maintenance and 20 per cent on light bulb replacement have been effected at the *Highland Cotton Mill, High Point, N. C.*, since the installation of five new General Electric load center substations a year ago, according to *L. M. Young*, Mill maintenance man.

Before the new larger power units were installed, the company had three 750 kva transformers which had progressively become more and more overloaded owing to increases in the mill electrical load. This overload and relatively long cable runs to many of the motors resulted in unduly low voltage at motors, causing them to overheat. Attempts to maintain motor voltage by using higher voltage taps on the transformers caused high voltage during light load periods and resulted in excessive lamp burn-outs.

To correct the situation and to provide additional power for anticipated further increases in mill load, four 1,500-kva and one 750-kva load center unit substations were installed. The various units were strategically located to obtain minimum length of cable to the load each unit served. The result has been stable voltage and maintenance savings.

The North Carolina company manufactures hosiery and underwear yarns, producing approximately 110,000 pounds per week. It now has sufficient power capacity to increase production by 25,000 to 50,000 pounds weekly.

For additional Helping The Man-In-The-Plant ideas, tools, methods and devices, check the feature article starting on page 65.

Here shop employees of the Temco Aircraft Corporation in Dallas, Texas, report on ten plant tested improved working methods.

Babcock & Wilcox Employs New Tube Extrusion Process

THE BABCOCK AND WILCOX COMPANY put into operation the first American Extrusion Press having the speed and other design features necessary to take full advantage of the Ugine-Sejournet Hot Extrusion Process late in 1951. Since the beginning of the year, this plant has extruded B&W Croloys 18-8S (Type 304), 18-8STI (Type 321), 25-20 (Type 310), 16-13-3 (Type 316) and Croloy 27 (Type 446), Pure Molybdenum and Pure Titanium successfully.

The most significant discovery, and the one which had a revolutionary effect on die life and surface quality, was the substitution of glass for the carbonaceous materials previously used as a lubricant. The glass, melting on contact with the hot steel, prevents seizing of the billet and tools, and insulates the tools from the heat of the billet. Of utmost importance in the rate of production, the excellent lubricating properties of the glass reduces the friction and makes it possible to increase the billet length.

The B&W Company plant in Beaver Falls, Pa., is specifically designed for the production of tubular and solid shapes. The billets are charged into a rotary hearth gas-fired furnace. After heating, if they are to be made into tubing, they are rolled across a "glass-pickup" table to the piercer charging device, or if they are for solids they by-pass the piercing operation and go directly to the salt bath furnace. The piercing is done with glass interposed between billet and piercing mandrel; and depending on analysis, either with or without glass between the container and the billet.

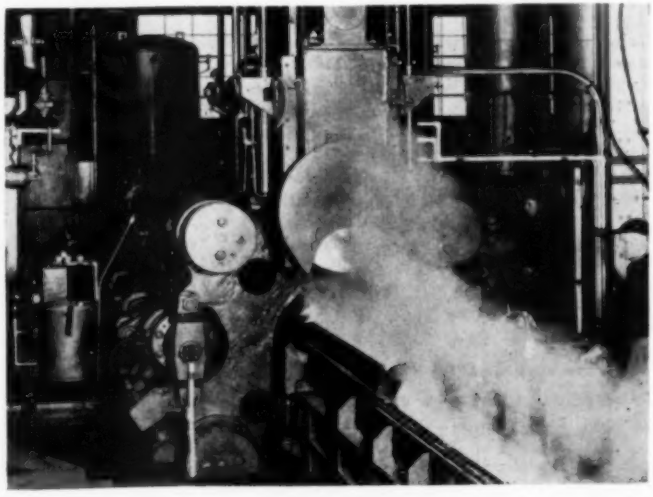
The pierced (or unpierced) billet is charged into a metal basket which supports it in a rotary salt bath furnace. After circling through the furnace, the billet is discharged into a trough on a transfer car to the extrusion press.

The transfer car has an inclined surface on which a Fiberglas mat is placed. As the car travels toward the extrusion press, the billet is raised out of the trough and rolled down the inclined plane fusing to the Fiberglas mat and picking it up. When the transfer car reaches the end of its travel, the billet has rolled into a trough at the front end. The trough lines up with the container bore, and the billet is automatically pushed into the container.

Previous to this time, a Fiberglas "sock" has been slipped over the mandrel and a glass cartridge placed against the die. With the mandrel lubricated by the Fiberglas "sock," the die lubricated by the cartridge, and the container lubricated by the glass picked up by the billet in passing across the transfer car, metal to metal seizure is prevented on all surfaces.

The actual extrusion takes place in from 2 to 4 seconds, yielding a piece from 20 to 60 feet long depending on the size of billet and area of extruded section.

New extrusion equipment recently installed at Babcock & Wilcox Tubular Products Division at Beaver Falls, Pa., opens up whole new horizon for the production of seamless tubing and solid shapes from unpiercable alloys. This is same plant which announced successful continuous casting of steel in 1948.



Specify **BOILER FEED PUMPS** by **Pacific**

for small and medium sized boiler plants

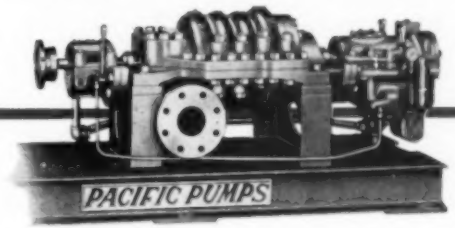
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RELIABILITY... DURABILITY...
RESISTANCE TO CORROSION-EROSION

DEPENDABLE PERFORMANCE AND THE HIGHEST FACTOR OF AVAILABILITY AT ALL TIMES

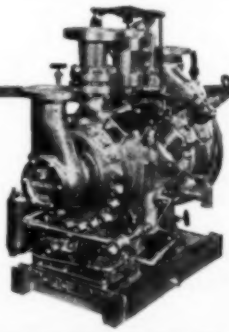
THE Pacific
MULTI STAGE TYPE JBF

Capacities To — 1000 GPM
Discharge Pressures To — 1000 psi
Electric Motor Drive To 3600 RPM
Steam Turbine Drive To 5000 RPM



THE Pacific
SINGLE STAGE-UNITIZED
STEAM TURBOPUMP

Capacities To — 500 GPM
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STEAM To 900 psi Pressure — 850° F. TT
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Speeds To — 10,000 RPM.



PACIFIC *Precision Built* PUMPS

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BF-15

Planned for Expansion...
so the Logical Choice was

KEWANEE

HEAVY-DUTY STEEL BOILERS



HOME for
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KIVETT & MYERS, Architects W. L. CASSEL, Engineer
Three Kewanee Heavy-Duty Oil-Fired Boilers installed by
A. D. JACOBSON PLUMBING and HEATING CO.

In planning institutional buildings today . . . careful consideration must often be given to later expansion of *both* building and equipment facilities.

Kewanee Boilers are capable of producing *more steam* than is guaranteed by their rated capacities, hence are ideally adapted when later expansion is needed. This fact plus a well known dependability and economy of fuel makes Kewanee the logical selection for important buildings of every type.

KEWANEE BOILERS

KEWANEE-ROSS CORPORATION
Division of American Radiator & Standard Sanitary Corporation
KEWANEE, ILLINOIS

Serving home and industry

new equipment (continued)

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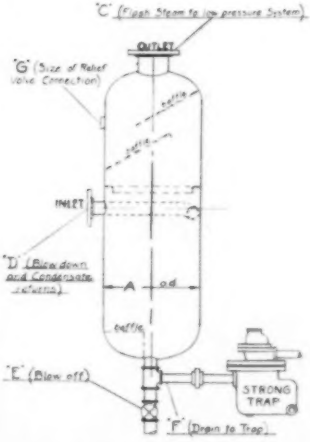
(Starts on page 8)

bination of black and a high visibility yellow make the most satisfactory color combination for safety barrier rope use. The new rope is made from wholly un-drawn filaments to obtain high elongation to discourage the use of the rope for purposes other than marking off dangerous or restricted areas.

Reflash Steam Separator

H-6 STRONG, CARLISLE & HAMMOND Co., 1395 West 3rd St., Cleveland 13, Ohio has developed a steam flash separator for use in recovering the excess heat from reflash steam and putting it to work in low-pressure heating or process lines for real savings in plants that have large amounts of high-pressure condensate or continuous blowdown.

The reflash steam separator, guaranteed to perform efficiently, is available in different sizes and is easily installed. The discharge line from high-pressure steam traps is run into the separator, which is (vented) connected into the low-pressure heating or process steam line. Water that remains after reflash steam is removed may be returned to the boiler for re-use, put through a heat exchanger, or exhausted. The separator can be used in high-pressure condensate and continuous blowdown systems.

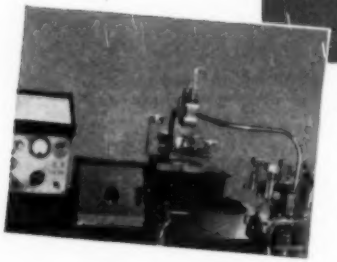


Strong, Carlisle & Hammond Company's reflash steam separator.

WHERE KNOWLEDGE IS POWER











Knowledge is POWER when it is put to practical use. Here are examples:

- Intensive investigation by P.P.&E. into graphitization of steel piping resulted in the development of materials and methods that inhibit this cause of power piping failure.
- Model testing, as applied by P.P.&E., makes possible complete analysis of a complex piping system as a check against theoretical calculations — thus helps to avoid excessive stresses, reactions, and movements in the final system which could damage anchors and other equipment, and affect joints.
- Ultra-sonic testing — a unique non-destructive method employed by P.P.&E. — assures quality control of materials and welding.

This type of knowledge — plus the practical experience P.P.&E. has acquired during fifty years of specialization IS power — because it results in greater safety, higher efficiency, and longer life from high-temperature, high-pressure piping.

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10 Forty-Third Street — Pittsburgh, Penna.

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"IT'S THE GREASE FOR TOUGH OPERATIONS"

—says

McCULLOCH MOTORS CORP.

makers of the famous McCulloch Chain Saws

"Three years ago, when we first started building power chain saws, we tested all types and makes of lubricants for the Zerol gears in the transmission. One of the greases selected for long tough operation was LUBRIPLATE. Since that time we have produced thousands of McCulloch Chain Saws and we now more than ever recommend the use of LUBRIPLATE in our power tools."

John L. Ryde
Vice Pres. and Chief Engineer

LUBRIPLATE Lubricants are available from the lightest fluids to the heaviest density greases. There is a LUBRIPLATE Product best for your every lubrication requirement. Let us send you case histories of savings that others in your industry are making through the use of LUBRIPLATE Lubricants. Also packed in handy tubes for use in portable tools, guns, fishing reels, lawn mowers and household appliances.

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Dealers Everywhere . . .
Consult Your Classified Telephone Book

LUBRIPLATE *The Modern Lubricant*

new equipment *(continued)*

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Adjustable Pallet-Skid Racks

H-7 MARKET FORGE COMPANY, Everett 49, Mass., is producing improved adjustable pallet racks and skid racks, specially designed to make use of every inch of existing storage space without new construction or extension.

These improved adjustable racks can be constructed to suit any special problem or requirement; are made to cut down materials handling costs; and suit any particular floor plan, manufacturing line, or storage plant. By arranging the units in tiers, air space is utilized to the maximum, providing increased manufacturing space. This arrangement also solves the inventory control problem—the stored articles can easily be seen.



Market Forge Company's adjustable pallet and skid racks increase efficiency in transporting and moving stock due to easy accessibility.

Electrically Heated Valves

H-8 OKADEE COMPANY, 332 S. Michigan Ave., Chicago, announces availability of electrically-heated valves, designed to keep valve mechanisms clear of frost and ice in liquid carbon dioxide lines at temperatures as low as —110 deg F.

Many other applications are being developed which include both hot, cold and viscous liquid and gas lines, as well as uses where heated valves have heretofore been economically impractical.

All heated valve sizes from 2 in. to 6 in. are available, with pneumatic, hydraulic, solenoid or manual control.

1 gasket or 1,000,000

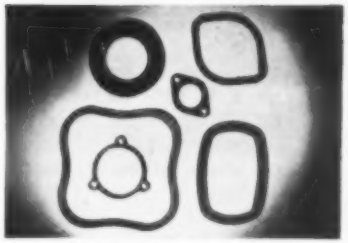
GARLOCK can supply all types of gaskets in *any* quantity to meet your requirements.

GARLOCK has the facilities to die cut, hand cut, mold, or machine all sizes and shapes of gaskets in *any quantity*. Yes, whether you are a small or big user, Garlock can supply you with the proper gaskets made accurately to your blueprint specifications or template.

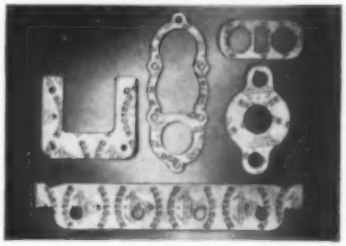
There's a Garlock gasket that answers your every requirement efficiently and economically. Some of the most widely used Garlock gasketing materials are:

- Compressed Asbestos with rubber, neoprene or buna-N binder
- Woven Asbestos
- Rubber—plain, cloth inserted or wire inserted
- Neoprene—plain or cloth inserted
- Buna-N
- Thiokol—plain or cloth inserted
- Silicone—plain or cloth inserted
- "Teflon"
- Vegetable Fibre
- Cork-Fibre
- Asbestos—metallic
- Leather

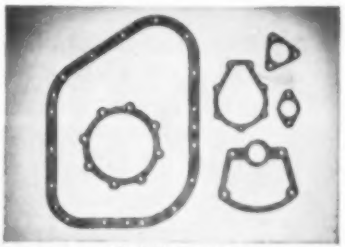
Let your Garlock representative help you solve your gasketing problems—call him today.



Compressed Asbestos Gaskets



Rubber Gaskets



Cork-Fibre Gaskets



THE GARLOCK PACKING COMPANY
PALMYRA, NEW YORK
In Canada: The Garlock Packing Company of Canada Ltd., Toronto, Ont.

GARLOCK

DEPENDABLE CONTROL of PROCESS LINES



with Everlasting Valves

Everlasting Valves give unobstructed, straight-through flow when open, and a lasting, leak-proof seal when closed. For control of lines carrying acids, alkalis, caustics, emulsions, syrups, cellulose, coal-tar, viscose and other chemical fluids, these valves give long, efficient service.

The self-grinding disc action and the close contact between disc and seat at any position keep out grit and other solids, assuring long life of Everlasting Valves. The speedy, easy lever-action operation gives dependable protection in emergencies.

Regularly supplied in cast iron, cast steel or acid-resisting bronze, but obtainable also in any specified metal or alloy that can be cast, machined and ground.

Let us send you full data on Everlasting Valves for process lines. Your request will receive prompt attention.

EVERLASTING VALVE COMPANY

49 Fisk St., Jersey City 5, N. J.

Makers of Lever-Operated Valves for Water, Steam, Oil, Gasoline, Acids, Alkalis and other Process Lines

EV-252



new equipment (continued)

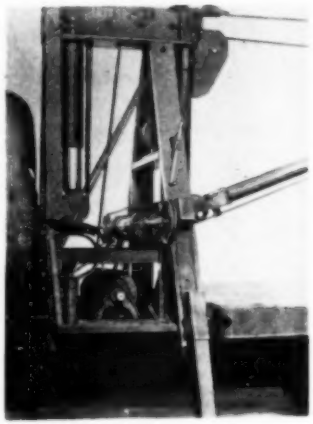
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Heating elements can be provided for either 110 or 220 volt operation, with inputs ranging from 400 to 3000 watts per unit. Heated valves for use in hazardous atmospheres will be offered soon.

Where flanged type Okadee valves are now in service, heating elements may be installed by simply exchanging standard studs for studs one inch longer.

Crane with Powered Boom

H-9 The PITMAN MANUFACTURING COMPANY, 300 W. 79th Terrace, Kansas City, Missouri, announces that it now has in production a new model of the Pitman Hydra-Lift crane with hydraulically-powered boom that can be mounted on the frame of any truck, 1½ tons or larger.



New model of the *Pitman Manufacturing Company's* Hydra-Lift crane with hydraulically-powered boom that can be mounted on the frame of any truck, 1½ tons or larger.

According to the manufacturer, the new model features a variety of improvements over the original production model. Hydra-Lift requires but 40 in. behind the cab of a truck, has a loadline capacity of 6400 lb and a swinging boom which telescopes from 12 to 17 to 22 ft.

The two chief improvements in the new model are a big increase in the unit's safety margin and the fact that it now is shipped almost completely pre-assembled, cutting measurably the time and cost of installation. Rated capacities are based on the tipping factor of a 1½ ton truck, with outriggers down, and thus have not been increased. But the wider safety mar-

Carroll Station Installs Conseco Non-Divided Flow Condenser



"CONSECO 6500 Sq. Ft., Two Pass, Non-Divided Flow Condenser, with bath type hot well and spring supports, installed in the recently opened . . . Carroll Station of the Iowa Public Service Company. Features of this Condenser are outside steam belt, deep water box and quick opening doors in channel covers. Also furnished with this equipment is CONSECO Twin Element, Two Stage Air Ejector. Auxiliaries include Condensate Pumps and Atmospheric Relief Valve."

***CONSULT CONSECO ENGINEERS** about your condenser and feedwater heater needs. They will be glad to tell about the advanced features which assure trouble-free, low cost performance in your plant*

CONSECO

CONSECO LINE includes: BOILERS • CONDENSERS • STEAM AIR JET EJECTORS • DEAERATORS • CLOSED HEATERS

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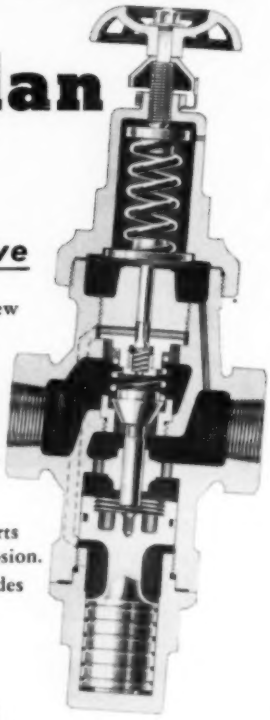
CONDENSER SERVICE & ENGINEERING CO.

HOBOKEN, NEW JERSEY

Just Clean it to Maintain it!

Masoneilan No. 11

Pressure Reducing Valve



That's what users tell us about this new better-than-ever Masoneilan Pilot Operated Steam Pressure Reducing Valve. Service records show maintenance consists of little more than keeping the moving parts clean.

What's more, it's the most *accurate, dependable* steam reducing valve we've ever offered.

More sensitive, its superfinished parts practically eliminate sticking or corrosion.

A wider range of adjustment provides a greater selection of reduced pressure settings.

Sturdier construction prevents possibility of damage.

All working parts may be removed and replaced with the valve in the line. Integral pilot valve simplifies assembly.

A HIGH Cq (Quality Coefficient) PRODUCT

Available for initial pressures up to 250 psi reduced to any pressure from 10 to 90 psi or 75 to 225 psi. Sizes ¼" to 2" in bronze; 2½" to 4" iron; or ½" to 3" steel.

MASONEILAN

Mason-Neilan Regulator Company

1206 ADAMS STREET, BOSTON 24, MASS., U. S. A.

Sales Offices or Distributors in the Following Cities:

New York • Syracuse • Chicago • St. Louis • Tulsa • Philadelphia • Houston • Pittsburgh Birmingham • Atlanta • Cleveland • Cincinnati • Detroit • San Francisco • Salt Lake City El Paso • Boise • Albuquerque • Charlotte • Los Angeles • Denver • Appleton • Corpus Christi New Orleans • Louisville • Mason-Neilan Regulator Co., Ltd., Montreal and Toronto

new equipment (continued)

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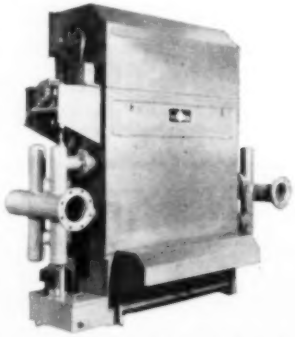
gin means less strain is placed on the crane when any given load is picked up. This in turn means less maintenance trouble and longer crane life.

Improved After Cooler Unit

H-10 NIAGARA BLOWER COMPANY, 405 Lexington Ave., New York 17, N. Y., announces a new improved design of the Niagara Aero After Cooler, for compressed air or gases, in which the cooling capacity of the units is increased from 25% to 75% over previous models.

Cooling is done by the evaporation of recirculating water sprays on the surface of tubes through which the compressed air passes. The increased capacity in the new models is gained by improved distribution of the compressed air in the machine and an increase in the amount of evaporating surface. Tube sizes have been increased to reduce friction. The equipment is designed for installation outdoors to provide cleaner compressed air and save space in industrial buildings. Freezing is prevented in winter by automatic control which shuts off freezing cold air from the spray chamber.

The cooling medium is air at the atmospheric wet bulb temperature which is cooler than the average summer temperature of surface cooling water. The new model, therefore, removes more moisture from compressed air than after coolers using surface water. Also since the compressed air is always cooled below the atmospheric dry bulb temperature it prevents condensation in compressed air lines, and damage to pneumatic tools, paint sprays and plant processes.



Cooling capacity of *Niagara Blower's* after cooler units for compressed air or gases has been increased from 25 to 75 per cent over previous models.

"Our Country's Strength is Created . . ."



REESE H. TAYLOR
President, Union Oil Company of California

"Our country's strength is created by the responsibility and solidarity of individual citizens in a self-chosen government and economy. It can—and must—be perpetuated against all who seek to undermine it. The men and women who invest regularly in United States Defense Bonds are contributing to our national integrity and to the traditions of personal independence so characteristic of a free people."

Every pay day, 6,500,000 employed men and women . . . "are contributing to our national integrity and to the tradition of personal independence . . ." by the systematic purchase of United States Defense Bonds.

How important is this contribution to national economy and personal security? Let's look at a few figures.

- the cumulative purchases of 6,500,000 Payroll Savers add up to $130,000,000 per month.
- the number of individual E Bonds sold in 1951 totaled 68,069,000 pieces—8% more than in 1950.
- purchases of $25 and $50 E Bonds—the denominations popular with Payroll Savers—were greater than the sales of $500 and $1,000 E Bonds.
- monthly redemptions of unmatured E Bonds during each of 9 months (April to December, 1951) were less than 1% of the amounts outstanding.
- the *cash value* of Series E Bonds held by individuals on December 31, 1951, amounted to $34,727,000,000—$4.8 billions more than the cash value of Series E's outstanding in August, 1945.

That Americans have built personal security and a reservoir of purchasing power exceeding $34.7 billions is due in no small measure to the patriotism and foresight of men like Mr. Taylor and other leaders of industry who have made the Payroll Savings Plan available to their employees.

For help with your Payroll Savings Plan, phone, wire or write to Savings Bond Division, U.S. Treasury Department, Suite 700, Washington Building, Washington, D. C.

The U.S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

SOUTHERN POWER & INDUSTRY

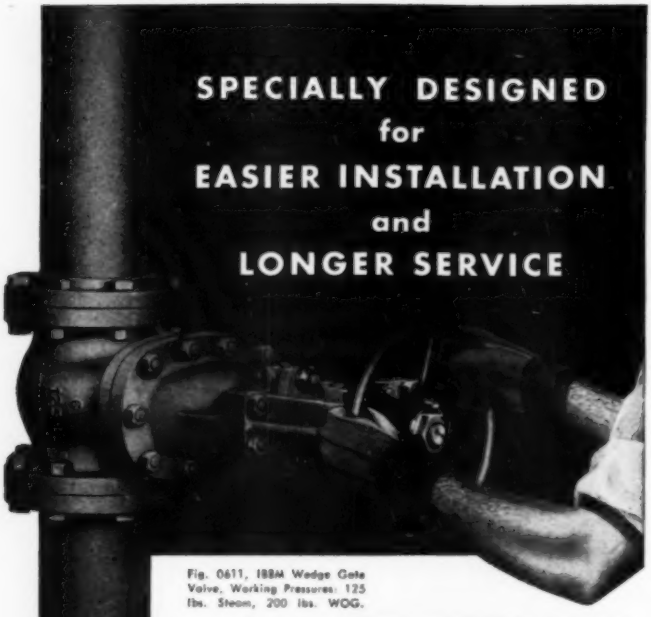


Fig. 0611, 188M Wedge Gate Valve, Working Pressures: 125 lbs. Steam, 200 lbs. WOG.

KENNEDY JOB-FITTED

Iron-Body Wedge Gate Valves

YOU SAVE TIME AND MONEY all along the line with Kennedy iron-body wedge gate valves because they are JOB-FITTED . . . every valve specially designed and engineered for the job it has to do.

THE WEDGE DISC is a cored casting of thick metal section, reinforced by integrally-cast interior posts and provided with openings to drain in any position.

HEAVY BRONZE DISC RINGS are forced into dovetailed grooves in the disc in a practically inseparable construction.

HIGHER STRENGTH IRON in the body and bonnet is actually 50% stronger than ordinary cast iron . . . and far exceeds A.S.T.M. requirements.

ALL CONTACT SURFACES between moving parts are bronze-to-bronze to assure easy operation.

RUSTPROOFED STEEL BOLTS AND NUTS have ample clearance to prevent distortion. Open-end wrenches may be used . . . no need for special tools. Valves can be repacked under full pressure.

EVERY FEATURE of the valve helps it do the job better . . . gives you a solid guarantee of economy and dependability whenever you install one of these Kennedy Job-Fitted Wedge Gate Valves.

BUY FROM YOUR LOCAL DISTRIBUTOR

WRITE FOR BULLETIN 107

Est. 1877

THE KENNEDY VALVE MFG. CO. • ELMIRA, N.Y.

VALVES • PIPE FITTINGS • FIRE HYDRANTS

new equipment (continued)

For more data circle item code number on the postage free post card—p. 17

Sprinkler Design for Special Hazard Protection

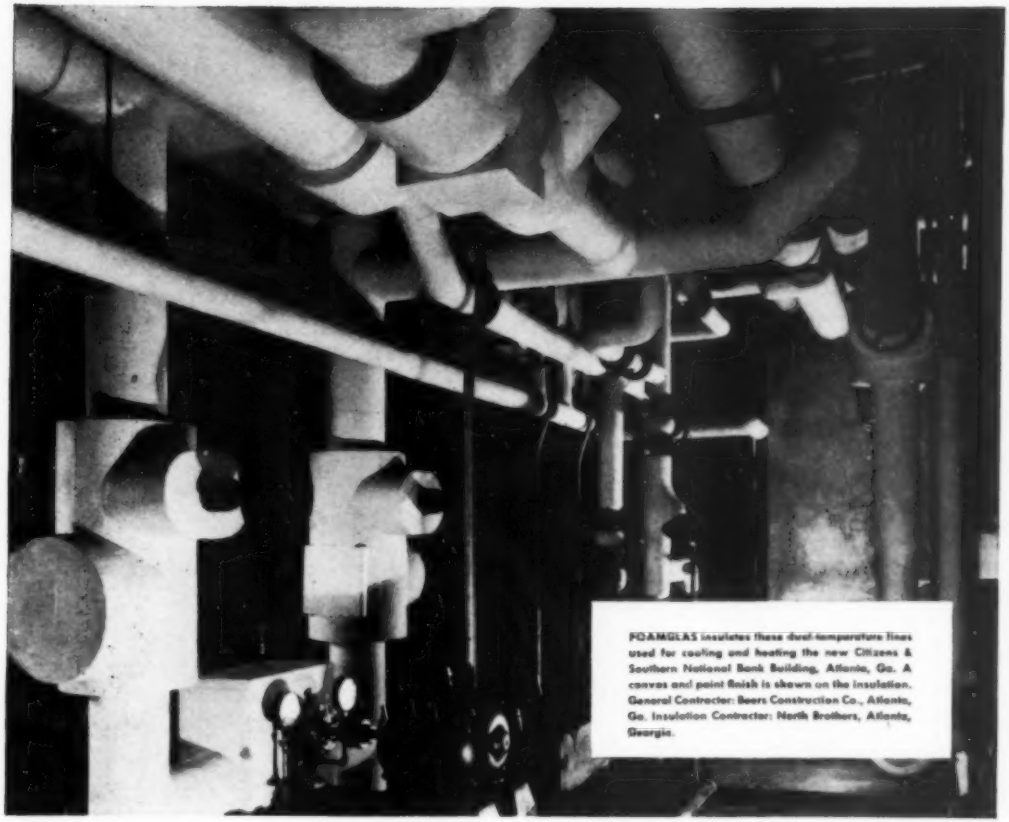
H-11 GRINNELL COMPANY, 200 West Exchange St., Providence 1, R. I., has introduced the new automatic Protecto-Spray for fighting fires at the molecular level by diluting the active ingredients of flame, to give quicker extinguishment.

When used in place of standard automatic sprinklers for special hazard protection such as high piled tire storage, it reduces ceiling scorching and checks fire spread with 30% less water. It dilutes both the oxygen and the hydrocarbons with water vapor until the mixture is too lean to burn. When heated oxygen collides with heated hydrocarbon molecules more heat is released. By interposing inert water vapor molecules between oxygen and hydrocarbons, collisions are prevented and the flame is extinguished.

The heat from a fire normally raises the temperature of nearby flammable material to its distillation and ignition temperatures. The automatic ProtectoSpray diverts this heat to vaporize water droplets. This re-



Heat from a fire normally raises the temperature of nearby flammable material to its distillation and ignition temperatures. *Grinnell Company's* automatic ProtectoSpray diverts this heat to vaporize water droplets.



FOAMGLAS insulates these dual-temperature lines used for cooling and heating the new Citizens & Southern National Bank Building, Atlanta, Ga. A canvas and paint finish is shown on the insulation. General Contractor: Beers Construction Co., Atlanta, Ga. Insulation Contractor: North Brothers, Atlanta, Georgia.

Use FOAMGLAS for dual-temperature service, too!

● FOAMGLAS will withstand *both* extremely high and extremely low temperatures over long periods of time. That's why FOAMGLAS is so popular among plant engineers for low and dual-temperature service. It is being used successfully on piping, fittings, towers, tanks and boilers. And, since FOAMGLAS is available in easy-to-lay rigid blocks, it is widely used to insulate walls, floors and roofs in normal temperature and refrigerated spaces.

FOAMGLAS is efficient and durable because it consists of millions of tiny air bubbles sealed in glass. Thus, FOAMGLAS will not absorb water or transmit vapor. It will not rot, become soggy, or slip out of place like ordinary insulation.

Fill out that coupon and let us send you a free sample of FOAMGLAS and our latest booklet.

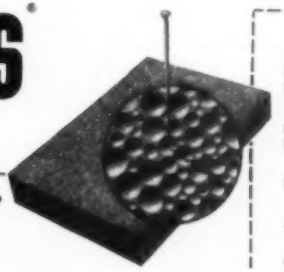
PITTSBURGH CORNING CORPORATION • PITTSBURGH 22, PENNSYLVANIA

PITTSBURGH PC CORNING

FOAMGLAS®

the cellular glass insulation

The *best* glass insulation is cellular glass. The *only* cellular glass insulation is FOAMGLAS. This unique material is composed of still air, sealed in minute glass cells. It is light weight, incombustible, verminproof. It has unusually high resistance to moisture, chemicals and many other elements that cause insulation to deteriorate.



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Dept. AE-72, 307 Fourth Avenue
Pittsburgh 22, Pa.

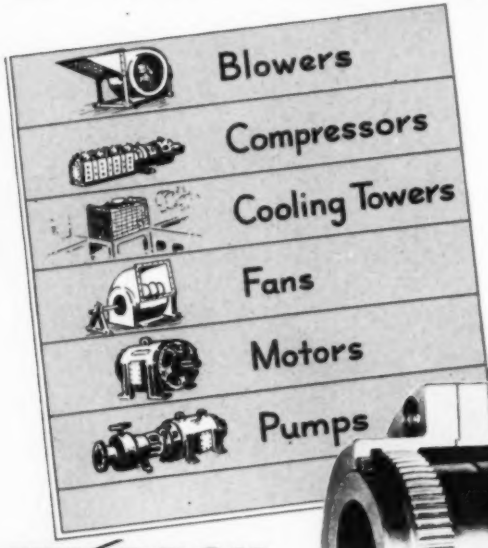
Please send me, without obligation, a sample of FOAMGLAS and your FREE booklet on the use of FOAMGLAS for Piping and Process Equipment.

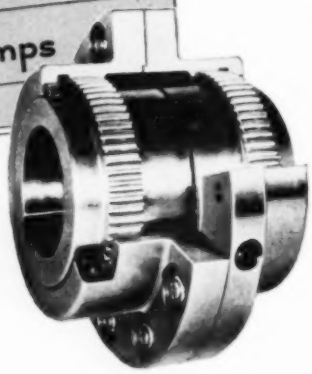
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Improved
Gear Type

From every standpoint—design, construction, operating features—these WALDRON Couplings give greater assurance of longer, trouble-free service. No other coupling has so many major construction features for greater operating advantages. An examination of its many design refinements will quickly explain why the WALDRON coupling is so consistently specified for all types of applications where dependability of performance is a first essential.

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explaining coupling features which give added insurance against coupling failure. No obligation.



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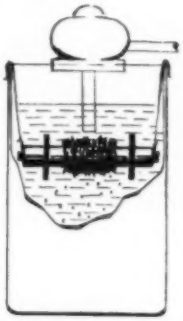
new equipment (continued)

For more data circle item code number on the postage free post card—p. 17

moval of heat checks the spread of fire and the resulting water vapor dilutes the flame gases so that they cannot burn. Producing a wide range of water droplet sizes, small ones to produce water vapor and larger ones to wet and cool the burning material, automatic spray is a new and more effective weapon against fire. It is approved by both the Factory Mutual Laboratories and the Underwriters Laboratories.

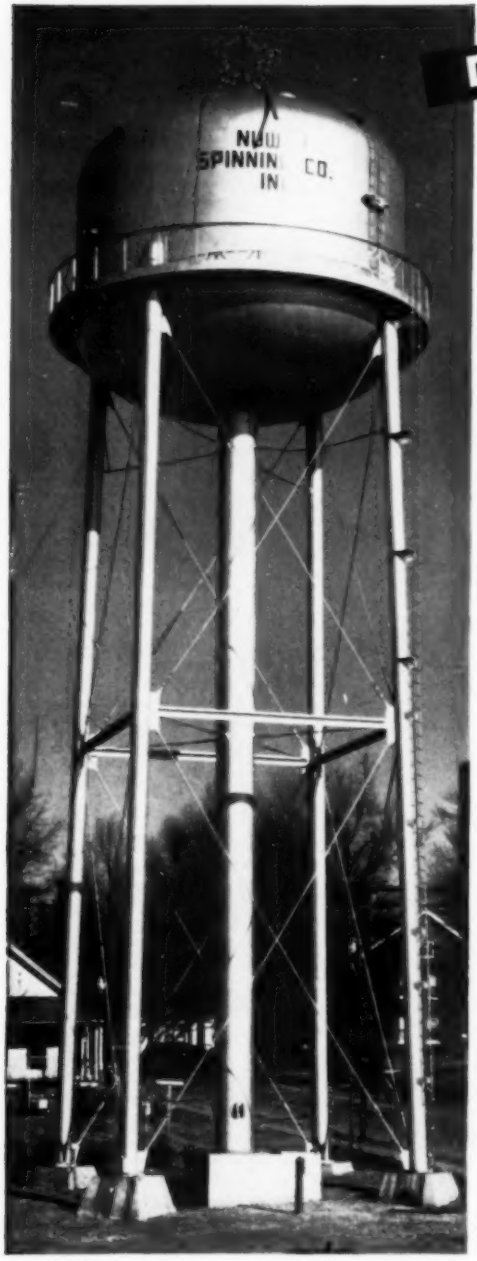
Coolant Pump Magnet

H-12 THE MULTIFINISH MANUFACTURING CO., 2114 Monroe Ave., Detroit 7, Mich., announces that after extensive testing the Magnetool low-cost Coolant Cleaner is now ready for general distribution. It is highly recommended for tool room grinders and lathes, or for light production drilling and tapping. It is not for heavy production grinding.



The Magnetool Coolant Cleaner, by *Multifinish Manufacturing Co.*, is recommended for tool room grinders and lathes or for light production drilling and tapping.

The magnetic unit 1¼ in. dia by 8 in. long is easily suspended under pump intake in coolant tank. All floating steel particles are trapped by the magnet instead of being pumped back into the system to damage work and tools. The unit accumulates a mass of chips 4½ in. long and 1 in. thick around its entire circumference. Load is removed simply by pushing wiper ring to opposite end of tube. The unit is also used to purify gear-testing tanks. Larger sizes for paint and porcelain-enamel tanks, and other applications are available to order.



DEPENDABLE FIRE PROTECTION

The success of a fire protection system in an industrial plant is measured by its performance — its ability to quench flames before they have a chance to gain headway.

A Horton elevated water tank and an automatic sprinkler system can provide your plant with 24-hour-a-day fire protection. The tank holds a reserve of water above your property, ready to flow the instant it is needed. There is little chance of mechanical failure. When a fire breaks out, heat from the flames opens one or more sprinkler heads. Water is sprayed directly on the area where the fire started.

The Nuway Spinning Company of Cherryville, N. C., recognized the importance of dependable fire protection and a dependable supply of water. They installed the 75,000-gallon Horton elevated water tank shown at the left and an automatic sprinkler system. With these adequate facilities for putting out fires, they are protected against costly damage.

Fire can be very costly! Many industrial plants do not carry sufficient insurance. Even those that do face the possibility of being forced to shut down for a period because of fire. The results are lost profits, customers and even employees.

When planning a fire protection system for your plant, carefully check the advantages offered by a Horton elevated tank. Ellipsoidal-bottom elevated water tanks, such as the one shown here, are available in standard capacities from 15,000 to 500,000 gallons. Write our nearest office for complete details.

Left: 75,000-gal. Horton ellipsoidal-bottom elevated water tank located at the Nuway Spinning Company mill in Cherryville, N. C.

CHICAGO BRIDGE & IRON COMPANY

Atlanta 3.....2180 Healey Bldg.
Birmingham 1.....1531 North Fiftieth St.
Boston 10.....1044—201 Devonshire St.
Chicago 4.....2107 McCormick Bldg.
Cleveland 15.....2218 Guildhall Bldg.
Detroit 26.....1534 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston 2.....2132 C&I Life Bldg.
Los Angeles 17...1545 General Petroleum Bldg.
New York 6.....3312—165 Broadway Bldg.
Philadelphia 3..1646—1700 Walnut Street Bldg.
San Francisco 4.....1531—200 Bush St.
Seattle 1.....1345 Henry Bldg.
Tulsa 3.....1628 Hunt Bldg.
Washington 6, D. C. .....1114 Cafritz Bldg.

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY *and* GREENVILLE, PA. *In Canada*—HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.

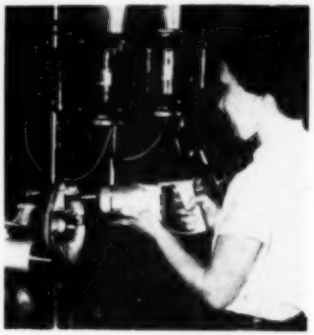


new equipment (continued)

For more data circle item code number on the postage free post card—p. 17

Portable Electric Drill

H-13 MALL TOOL COMPANY, 7725 South Chicago Ave., Chicago 19, Ill., has introduced a new line of portable electric drills, designed to meet all production line requirements.



Mall Tool Company's 14 in. capacity drills offer a choice of free drilling speeds of 600, 800, 1000, 1750, 2500, 3500 or 5000 rpm. Three styles are available.

These ¼ in. capacity drills offer a choice of free drilling speeds. Three styles are available: Pistol grip, spade handle and center contour handle design.

Ample operating freedom is gained through compact size and a weight of 3½ to 4 lb. This lightweight aluminum construction is coupled with balanced armatures and precision matched gears to reduce tiring vibrations. All three models feature universal type ac-dc motors and can be had for either 115 or 230 volt, 25 to 60 cycle current.

Self-Setting Clamps

H-14 ALPHA TOOL & SUPPLY COMPANY, Box 119, Westwood, N. J., is distributor for new Autoset self-setting clamps for presses and machine tools.

These clamps are constructed on a scientific design based on the use of three interrelated curved contact surfaces. The new design allows each clamp a gripping capacity for a wide range to accommodate various thicknesses of bolsters.

The elimination of packing at one end—which is the normal requirement in the old type of clamps—plus the solid gripping, ensures against the danger of any tool slipping from the position in which it is held. As a result of this solid gripping capacity,

We saved 33.9% on fuel alone with this Iron Fireman method of coal firing



Mr. H. A. Quinn
Manager Toledo Laundry



Here's the Record

Fuel costs down 33.9%

Steam processing temperature up 5%

Average CO_2, 12.9%

Boiler pressure, 125 PSI

Average stack temperature, 452° F.

Iron Fireman

PNEUMATIC SPREADER STOKERS

A COMPLETE COAL DRYING, CONVEYING, DISTRIBUTION AND COMBUSTION SYSTEM. Coal is thoroughly dried and pre-heated and is conveyed pneumatically to furnace grates. Dry coal assures far more uniform distribution over *entire* grate in shallow, uniform fuel bed. Pre-heated fines burn in suspension, reducing cinder carry-over and greatly improving combustion efficiency and responsiveness as compared with stokers which do not pre-heat coal.

Fuel savings, plus labor savings resulting from automatic conveying, plus the stoker's ability to follow a fluctuating load—these are the reasons given by Mr. Quinn for installing the Iron Fireman Pneumatic Spreader at the Toledo Laundry after several years' experience with similar Iron Fireman equipment in the company's two other plants.

No other stoker combines the many exclusive features and money-saving extras of the Iron Fireman Pneumatic Spreader stoker. Manual coal handling is completely eliminated—and without extra cost, because the automatic coal conveying system is part of the stoker itself. So flexible is this conveying system that coal bunkers can be located almost anyplace with reference to the boilers—back, front or sides. In one installation that has been operating for years coal is fed from bunkers 32 feet below the firing floor.

Fully modulated fuel feed and air volume are automatically synchronized. Air supply is kept in step with coal feed-rate at all times. Coal is thoroughly pre-dried for uniform distribution. Capacities range to 1,000 boiler horsepower for a single unit. Multiple units for larger boilers. Send for descriptive literature.

Coal, Gas, Oil firing equipment for heating, processing, power



WRITE FOR CATALOG

IRON FIREMAN MANUFACTURING CO.
3254 West 106th Street, Cleveland 11, Ohio.

Send me literature on the Iron Fireman Pneumatic Spreader Stoker.

Name_____

Address_____

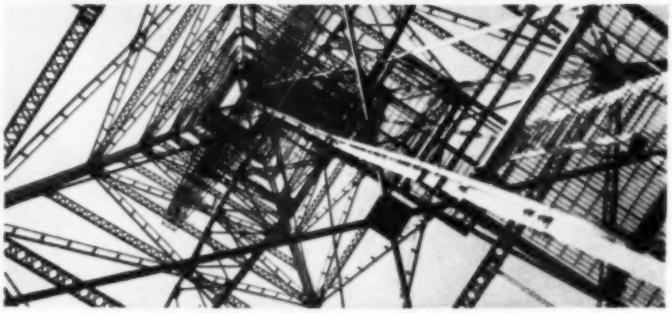
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BOILER TUBE CO. OF AMERICA

Tube Stocks and Bending

BOILER TUBE CO. OF AMERICA
McKEES ROCKS, PA.
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PITTSBURGH
CHICAGO
FRED S. RENAULD & CO.,
LOS ANGELES

SUBOX PAINTS BEST FOR LOW COST PRESERVATION OF GALVANIZED TOWERS



A Single Coat on Weathered Structures Lasts 5 to 8 Years

Subox and Subalox anti-corrosive paints conserve ALL galvanized structures better at lower cost. Painted when weathered to first sign of rust, towers receive a tough, weather-resistant armor that won't chip, crack or blister.

Subox' basic pigment is suboxide of lead — the finest anti-corrosive base. 25 years of Subox preventive-maintenance leadership attested to by industrial users throughout U. S. and Canada.

SEND FOR FREE STUDY "PAINT GALVANIZED TRANSMISSION TOWERS FOR LONG LIFE".



new equipment (continued)

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an Autoset clamp with a ⅝" diameter bolt will hold as safely as a ¾" diameter bolt on the old type of clamps. These new clamps have been evolved to meet the requirements of any normal clamping on power and hand presses, lathes, drills, milling machines, shapers, planers, grinders, etc.

Chemical Service Pump

H-15 WARREN STEAM PUMP CO., INC., Warren, Mass., has introduced the improved Warren-Quimby process and medium duty chemical service pump Type "G."



Warren Steam Pump Company's service pump available in 1, 1¼, 1½, 2, and 3 in. sizes up to 400 gpm heads to 240 ft.

The manufacturer recommends it for circulating and transfer service for various process and chemical liquids; filter press service; condensate return and low pressure boiler feed service; handling slurries and other liquids containing moderate quantities of small solids in suspension.

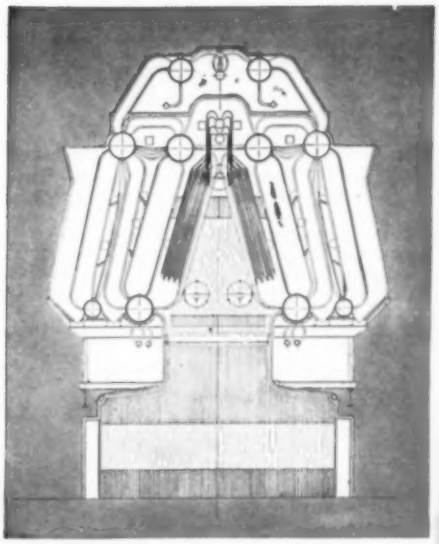
The pump features simplicity of design, sturdy bearings, extra deep stuffing box, tapped catchall, together with strong construction.

Versatile Plastic Tape

H-16 LABELON TAPE CO., INC., 450 Atlantic Ave., Rochester 9, N. Y., is producing plastic tape to be used for labeling stock of all kinds, as well as work in progress and undergoing repair, spare parts, tools and dies, jigs, stock bins, fixtures, metallurgical test samples, laboratory equipment and many other items for which a label is needed.

The new tape is pressure sensitive

"... a remarkable job of keeping the boilers clean"



Nominal rating: 850,000 pounds per hour at 400 psi and 750° F. Each Ladd-type C-F boiler has six fully-automatic Vulcan long retractables installed in very congested space where temperatures are severe. The boilers are kept clean at all times. No hand lancing is needed.

HERE'S WHAT THE PRODUCTION DEPARTMENT REPORTED

... "The first year of operation of the Vulcan retractable soot blowers at ..... Station has been a decided success. A total of eighteen blowers (six per boiler) have been in daily service without the loss of a single lance ...

"... the soot blowers have done a remarkable job of keeping the boilers clean. Each ... has been kept clean and in condition to exceed a million pounds of steam per hour rating at any time."

—— V ——

These three boilers had been in service almost twenty years. The original soot blowers—even when supplemented by daily hand lancing—had been unable to clean adequately the boiler and superheater tubes.

Narrow aisles and interferences from building steel and other equipment created a difficult installation problem, but Vulcan solved it. Just as Vulcan can solve your trickiest problem keeping boilers clean.

COPES-VULCAN DIVISION
CONTINENTAL FOUNDRY & MACHINE COMPANY
ERIE, PENNSYLVANIA

VULCAN *Automatic Soot* **BLOWERS**

new equipment (continued)

For more data circle item code number on the postage free post card—p. 17

(sticks without moistening to any smooth surface), and may be written on with a pencil, stylus or dry ball point pen. The writing appears like magic, but it is not on the surface of the tape. It is actually underneath an outer transparent plastic layer, and it is the pressure of the writing instrument alone that causes the writing to appear. Thus protected by a plastic layer, the writing cannot be smudged and is soilproof, oilproof, waterproof and acid resistant.

Labelon will stick, and writing on it remains legible over a temperature range of −40 to 160 F. Furthermore, the tape will not curl or discolor with age. It can be transferred repeatedly from one surface to another without leaving a sticky residue or losing adhesive qualities.

The new tape is available in 400 in. and 800 in. Industrial rolls in ½ in., ⅝ in., ¾ in., 1 in., 1½ in. and 2 in. widths, writing to appear in a choice of black, blue, red or green.



Plastic tape of *Labelon Tape Co.* sticks without moistening, won't smudge or smear, and resists dirt, grease, water and acids. Many industrial plant uses including stockrooms and tool cribs. Label holders are not required and tape strips off easily.

BLAW-KNOX GRATING



Electroforged into rigid, one-piece panels.



Twisted cross bar prevents slipping.

...GIVES BETTER SERVICE ON 5 COUNTS

1 SAFER FOOTING
2 GREATER STRENGTH
3 LONGER LIFE
4 LOWER MAINTENANCE
5 MORE OPEN SPACE

Bring your open steel flooring problems to Blaw-Knox for expert help. Bulletin 2365 sent on request.

Grating Department
BLAW-KNOX DIVISION of Blaw-Knox Company
2034 Farmers Bank Bldg., Pittsburgh 22, Pa.

BLAW-KNOX *Electroforged* STEEL GRATING

Books for the Plant Engineer

ASTM Specifications for Steel Piping Materials

PUBLISHED BY AMERICAN SOCIETY FOR TESTING MATERIALS
1916 Race St., Philadelphia 3, Pa.
384 pages
Price, $3.50

This compilation sponsored by ASTM Committee A-1 on Steel contains in their latest approved form the 56 widely used ASTM specifications for carbon-steel and alloy-steel pipe and tubing, including stainless. Numerous emergency alternate provisions applying to specifications are furnished with the volume.

The book is of service to those concerned with pressure piping, power generating, the petroleum field, the distribution of gas, oil, and water; and to individuals in every industry where these materials are important.

Electrical Measurements

BY FOREST K. HARRIS
PUBLISHED BY JOHN WILEY & SONS, INC.
440 Fourth Ave., New York 16, N. Y.
784 pages
Price, $8.00

"Electrical Measurements" covers material from basic principles to applications within the field of d-c and low-frequency applications. The author discusses the origins, relations, and dimensions of electrical units. He then systematically presents basic instrument theory, starting with the study of the galvanometer.



"...On the feet of Individuals."

Society advances on the feet of individuals. We Americans live under the highest standard ever achieved because we believe in and are permitted currently to practice three of the cardinal principles of progress—Invention, Research and COMPETITION.

Nineteen basic inventions influence our pattern of life today. Each one was created to satisfy a fundamental need for improvement—a modern means of competing as against outmoded procedure. Each one, such as the electric light, the telegraph, the amplifying tube, the induction motor, created a new industry in which numerous companies strove in free competition for the maximum share of business.

For example, since Thomas Edison invented the incandescent filament lamp in 1880, the electric light industry has grown to an annual volume of $501,500,000 in light bulbs alone; in May, 1906 the Wright Brothers received the patent for their flying machine; the value of aviation manufactures in 1951 in the United States alone was estimated at $3,350,000,000 and in February, 1952, records show a $10½ billion backlog of orders.

More rapid still is the growth of the radio-television industry which today produces some $230 million worth of home radio sets and $1,570,800,000 in television sets. In every case, employment and sales volume grew enormously and the public enjoyed huge personal benefits.

Side by side with Invention came Research, exemplified by the competition of intelligent men questing for new materials, new methods, new processes, new scientific truths. Current advertisements tell of hundred-year tests to assure better materials for the future, technology that produces metals to withstand almost inconceivable heat, machines calculating 20,000 times faster than the mind of man, medicines that cure "incurable" diseases, food processes that cook, sterilize and pack hundreds of cans a minute. And in every case, the public enjoys huge personal benefits.

This is what James A. Decker undoubtedly had in mind when he wrote the line, "Society advances on the feet of individuals." These "individuals" are you and I, all our countrymen, benefiting every day from Invention, Research—and from COMPETITION.

Developing inventions, marketing products, and pursuing scientific research require substantial investments. A grave danger to their future now looms. In 1951, corporation net profits suffered a loss of 21% over the previous year. The reason—taxes too high, government controls and policies that interfere too greatly with private industry. If this continues, financial resources will dwindle, competition will be stifled.

Without free competition, American progress stops. No country can long exist when its government calls all the shots. We need competition to assure progress for people.

★ ★ ★

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THE COMPETITIVE SYSTEM DELIVERS THE MOST TO THE GREATEST NUMBER OF PEOPLE

NEWS for the South and Southwest

Metals Society Honors Atlantic Steel President

ROBERT S. LYNCH, President of the Atlantic Steel Company, Atlanta, Georgia, was honored at the recent annual meeting of the Georgia Chapter, American Society for Metals, with the Chapter's annual Metalworking-Southeast Award in recognition of his contributions to the metalworking industry.

The citation was awarded by the Georgia Chapter to Mr. Lynch in recognition of his outstanding contributions to its organization as committee chairman, chapter chairman, national committeeman, and constant benefactor.

Mr. Lynch has served as finance chairman of the Georgia Chapter and was its fifth chapter chairman during 1946-47. From 1948 through 1951 he served on the advisory committee of the local chapter. He has also been a member of the national A.S.M. nominating committee and has held a two year term on the national A.S.M. finance committee. Mr. Lynch was elected a director of the American Iron and Steel Institute at the recent annual meeting held in New York.



Robert S. Lynch, President of the Atlantic Steel Company, Atlanta, Georgia, receives the 1952 Metalworking-Southeast Award from retiring A.S.M. Chapter Chairman, *Frank F. Ford*, of Ford-Kilbourn, Atlanta, Georgia.

FUTURE EVENTS Of Engineering Interest

PAN-AMERICAN UNION OF ENGINEERING SOCIETIES, Engineers Joint Council, 29 West 39th St., New York 18, N. Y.
Aug. 25-30, Third UPADI Congress, Tulane University, New Orleans, La.

NATURAL GASOLINE ASSOCIATION OF AMERICA, Wm. F. Lowe, Sec'y, 422 Kennedy Bldg., Tulsa 3, Okla.
Oct. 19, Southern Regional Meeting, The Blackstone Hotel, Tyler, Texas

NATIONAL ASSOCIATION OF PURCHASING AGENTS, George A. Renard, Exec. Sec'y, 11 Park Place, New York 7, N. Y.
Oct. 19-21, 7th District, 9th Annual Conference of Purchasing Agents of the Southeast, J. R. Carmichael, Conference Program Chmn., Atlanta, Ga.

SOUTHERN ASSOCIATION OF SCIENCE & INDUSTRY, H. M. Conway, Jr., Dir., 5909 Peachtree Road, Atlanta, Ga.
Oct. 23-24, Southwide Chemical Conference, Auburn, Ala.

AMERICAN GAS ASSOCIATION, H. Carl Wolff, Mgng. Dir., 420 Lexington Ave., New York 17, N. Y.
Oct. 27-Nov. 1, Annual Convention, Auditorium, Atlantic City, N. J.



Southern Gas Association's Galveston Meeting

Newly elected officers and directors of the Southern Gas Association—front row: *J. L. Campbell*, New Orleans Public Service, Inc., re-elected secretary; *H. V. McConkey*, Atlanta Gas Light Co., re-elected treasurer; *J. C. Flanagan*, vice-chairman advisory council, United Gas Corp., Houston; *J. H. Wimberly*, Houston Natural Gas Corp., president; and *H. K. Griffin*, first vice president, Mississippi Gas Company, Meridian, Miss.

Back row: *Eli R. Cunningham*, director, Texas Eastern Transmission Corp., Shreveport, La.; *Willard G. Wiegel*, director, Lone Star Gas Company, Dallas; *Wm. D. Mastin*, director, Robertshaw Fulton Controls Co., Chattanooga; and *Kyle H. Turner*, assistant secretary, Atlanta Gas Light Co.

Setting new records for over-all registration figures with a total of 1470, and with each of the sessions handling overflow attendance, the 44th annual convention of the SOUTHERN GAS ASSOCIATION, held in Galveston April 28-30, was another noteworthy milestone in the progress of that group.

Each of the five principal sections of the association—Accounting, Distribution, Employee Relations, Transmission and Sales, had two sessions, while the group interested particularly in accident prevention within the industry held two forums. Two general sessions brought the entire assembly together. At the first of these, in addition to addresses by the president of the S.G.A., L. L. Dyer, and the managing director, Robert R. Suttle, talks were given by Charles E. Bennett, president, American Gas Assn., "The Path of Progress," and Gerry Swinehart, president, Carl Byoir & Associates, who chose as his subject "What Is This Thing Called Public Relations?"

At the Wednesday general session, besides reports of committees, Chester L. May, vice-president, Lone Star Gas Company, Dallas, discussed "Modern Management Merchandises," and Edwin Vennard, vice-president, Middle West Service Co., Chicago, spoke on "How to Keep Freedom."

At the annual banquet the officers for the year 1952-3 were elected, and the time and place of the next convention announced as being New Orleans, May 11-13, 1953.

Brief adaptations of several papers of special interest to Southern industrial plant personnel are featured on the Industry Speaks page of this issue.

NEW! HEAVY DUTY

CHELSEA FANS

POWER CHELSEA LINE FANS

–for industrial applications

DIRECT DRIVE OR BELT DRIVE
NON-OVERLOADING PROPELLERS

SOLVE YOUR VENTILATING PROBLEMS

with Chelsea's new heavy duty airfoil type exhaust fans. For use in exhausting, duct work, filter installations, range or vat hoods, penthouse units, paint spray booths, where static pressures are encountered.

WRITE FOR NEW CHELSEA CATALOG No. 400

including detailed information on type, size, specifications, engineering data and installation recommendations. 30 types and over 200 sizes. Please address requests to Dept. G-7.

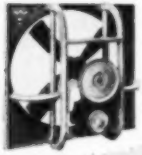
FOR FACTORIES, FOUNDRIES, MINES, MILLS
—totally enclosed ball-bearing motors



● **TYPE PLF POWER LINE DIRECT DRIVE** — 16" to 48" in all H.P. ratings. Square frames for easy installation.



● **TYPE PLDX POWER LINE DUCT BOOSTER**—Motor external to Air Stream. 16" to 48" in all H.P. ratings.



● **TYPE PLBD POWER LINE BELT DRIVEN** — 24" to 48" in all H.P. ratings. Square frames for easy installation.



● **TYPE PLDU POWER LINE AIR BLASTER**—For spot cooling — available on pedestal. 18" to 42" in all H.P. rating.

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PROPER VENTILATION IS AN INVESTMENT!

Look for this Symbol of Quality . . . → CHELSEA

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CHELSEA FAN & BLOWER CO., Inc.

PLAINFIELD, NEW JERSEY

THERM-ENOMICS* by Baldwin-Hill

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Powerhouse Cement

...insulates as it finishes



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Inside, outside—on a wall, overhead, Baldwin-Hill low-shrinkage Powerhouse Cement insulates as it finishes—can be troweled on a surface as easily as buttering toast. • One application gives an all-over even coat. Powerhouse Cement forms a permanent bond with blocks, blankets or plastic cement without special preparation and withstands temperatures up to 1700° F. • Apply it in thicknesses up to one inch . . . initial set in two hours . . . dries to a smooth, crack-free hardness, ready for a final coat of water or oil-base paint. Specify Powerhouse Cement for the best in insulating, finishing cement—and installation economy. Get direct savings in application and maintenance cost . . . Therm-enomically.

For complete information on other B-H Therm-enomical insulations, clip this coupon and attach to your signed letterhead.

*Economics of engineered heat control.

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☐ POWERHOUSE CEMENT
(High-adhesion, Black Rockwool Insulating-Finishing Cement)

☐ MONO-BLOCK (Porous, felted, Black Rockwool Insulation Block)

☐ BLANKETS (Metal-bonded, versatile, Black Rockwool Overall Insulation)

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BALDWIN-HILL COMPANY, 607 BREUNIG AVENUE, TRENTON 2, N. J.

JEFFERSON

300 LB.
Trouble Free Unions
for Tough Jobs

Jefferson Unions are made of Air Furnace Malleable Iron of an average tensile strength of 55,000 p.s.i., with a yield point of 36,000 pounds and an elongation of 15% in two inches.

Our seat rings are cut from seamless drawn brass tubing, free from all casting defects—sound and uniform always.

They are accurately tapped at all times; are carefully air tested and inspected before shipment, and each and every one approved only if they meet our rigid standards of inspection.

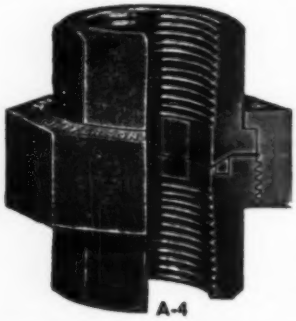
Slightly Higher Priced
But more than worth it.

See these outstanding features—

★ A ground ball joint to give leak-proof service
★ Octagonal with square corners fits any type of wrench
★ No gasket required, hence no maintenance problem
★ Hot-dip galvanized to Government Standard for corrosion resistance

Made in all thread sizes from ⅛" to 4" American Standard Taper Threads.

Also manufacture Excel 250 lbs and Master 150 lbs. All unions can be furnished with all-iron seats.



A-4

JEFFERSON
UNION CO.
650 WEST 26th St., NEW YORK 1.
79 GOODING ST., LOCKPORT, N.Y.
45 FLETCHER Ave., LEXINGTON, MASS.

news for the South and Southwest *(continued)*

A. O. Smith Corp—Houston

FRANK W. ROW, formerly of the Southwest LPG sales group of A. O. SMITH CORP., has been appointed national LPG sales coordinator for the company.

He is operating as a member of the staff of Group Executive C. R. RIGBY, general manager of HOUSTON WORKS, which produces the company's line of liquefied petroleum gas systems.

Kaiser Aluminum & Chemical Birmingham Sales Office

Establishment of a new sales office in BIRMINGHAM has been announced by KAISER ALUMINUM & CHEMICAL SALES, INC. LLOYD SHEEP, formerly a service engineer with the company's ATLANTA office, will head the new office located in the Brown-Marx Building.

Warren Steam Pump—Atlanta

WARREN STEAM PUMP COMPANY, INC., Warren, Mass., manufacturers of a complete line of centrifugal, reciprocating and rotary pumps, announce the appointment of STEPHEN C. MAY as their Atlanta sales agent. His headquarters will be at 585 Sherwood Road, N.E., ATLANTA 5, GEORGIA. Territory includes GEORGIA, SOUTH CAROLINA, parts of FLORIDA, NORTH CAROLINA and TENNESSEE.



Stephen C. May recently set up his manufacturers' representative business in Atlanta, Georgia, to serve a number of industrial and power accounts.

Mr. May was graduated from Georgia Institute of Technology in 1925. He has had wide engineering and sales experience in combustion and hydraulics, his most recent assignment being as vice president and general sales manager for Blackmer Pump Company, Grand Rapids, Michigan.

Philip J. Duffy Representing Lindberg Eng. in Southeast

The Southeastern office of the LINDBERG ENGINEERING COMPANY, manufacturers of heat treating furnaces, high frequency equipment, and melting furnaces, is now located at 1170 Pine Ridge Road, N.E., ATLANTA, GEORGIA. PHILIP J. DUFFY is District Sales Manager.

Mr. Duffy has been connected with the Lindberg Engineering Company for over 13 years, serving previously in a sales capacity with the company's home office in Chicago. He will offer technical assistance on heat treating and melting problems in industrial plants throughout Alabama, Georgia, Mississippi, and Florida.

Lindberg Engineering manufactures a complete line of industrial furnaces — tempering, atmosphere brazing and sintering, carbonitriding; atmosphere generators; melting furnaces, gas, oil and electric; two-chamber induction melting furnaces; and high frequency induction heating units.



Nothing conveys an impression of quality and prestige more readily than a perfect business card designed by us.

A letter from you will bring an assortment of the business cards we have made for others.

THE JOHN B. WIGGINS CO.
636 So. Federal Street, Chicago 5

WIGGINS
Peerless Book Form
CARDS

KIRK AND BLUM DUST CONTROL SYSTEM

Safeguards Workers

Saves Valuable By-products

. . . . PAYS FOR ITSELF!



One of two tilting reduction furnaces. Babbitt trimmings are melted down, separated from steel parts and other foreign matter.

In the reclamation of costly automotive babbitt alloy in a reduction furnace, toxic fumes and lead oxide dust are formed. The lead oxide dust is as valuable as it is hazardous. KIRK & BLUM was called on to solve this problem.

For each of two reduction furnaces (one shown in photos) a complete enclosure was provided. No dust or fumes can escape to the room. The enclosure is exhausted to a battery of four KIRK & BLUM high efficiency centrifugal collectors which separate the lead oxide dust. Four to five hundred pounds of this valuable by-product are reclaimed each week. From a "safety" and also a "salvage" view point the efficient system has proved a fine investment, which will pay for itself in a short time.

Air handling problems solved by the Kirk & Blum organization cover every phase of industry. Further examples are illustrated and described in a catalog, "Fan Systems for Various Industries." Copy on request.

FOR CLEAN AIR . . . THE INVISIBLE TOOL

KIRK AND BLUM

DUST CONTROL SYSTEMS

THE KIRK & BLUM MFG. CO.
3198 Forrer Street Cincinnati 9, Ohio



New Plant Making Agricultural Ammonia Uses Frick Refrigeration

The Mississippi Chemical Corp. at Yazoo City uses three Frick compressors to hold 2,000 tons of liquid ammonia in the spherical tanks (at upper right) by reducing the pressure and temperature.

This eight-million-dollar plant, built by 10,000 stock-holding farmers, produces both liquid ammonia and solid ammonium nitrate for use as fertilizer.

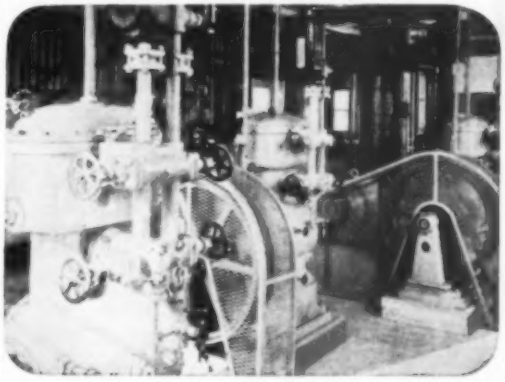
Installation by Munford Engineering Co., Frick Distributors at Jackson.

For that all-important cooling job of YOURS, get in touch with

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA. U.S.A.

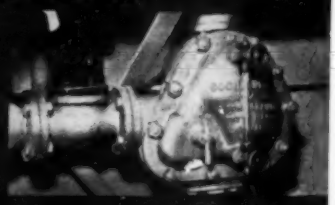
Also Builders of Power Farming and Sawmill Machinery

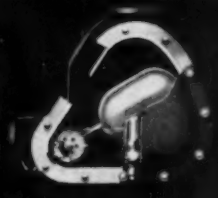
Three Frick Compressors in Service at the Mississippi Chemical Corp.



COCHRANE MULTIPORT DRAINER
(Continuous Flow Steam Trap)

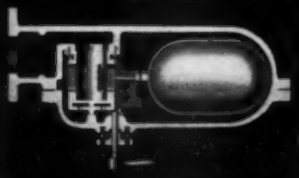
CONTINUOUS DRAINAGE of low pressure condensate and HIGH DISCHARGE CAPACITY are features of the Cochrane Multiport Drainer that have made these continuous flow steam traps popular the world over.





Balanced Rotary Valve and large port areas permit instant response to great discharge demands. Valve opening is determined by height of water in float chamber. As volume of water increases, the larger the valve opening becomes.

Other features: Valve never leaves its seat and is self-cleaning. Inlet at top prevents possibility of trap becoming air bound. Rotary Valve Seat is attached directly to float stem, one moving element. Write for Publication 4340.



COCHRANE CORP., 17th ST. & ALLEGHENY AVE., PHILADELPHIA 32, PA.

EXTRA YEARS OF MORE DEPENDABLE POWER

. . . at less cost per pound of steam

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TODD BURNERS

GAS OR OIL

COMBUSTION EQUIPMENT DIVISION

TODD SHIPYARDS CORPORATION

81-16 45th Avenue Elmhurst, Queens, N. Y.

TODD NEW YORK, U.S.A.

news (continued)

A. O. Smith—New Orleans

WILL CAIN has been appointed sales representative for the A. O. SMITH CORP., 538 International Trade Mart, NEW ORLEANS, LA. Mr. Cain, a 1948 graduate of the University of Texas, previously was a sales engineer on A. O. Smith's Houston staff.



Will Cain, New Orleans Sales Representative for the *A. O. Smith Corp.*

Mr. Cain will handle process equipment, line pipe casing, industrial grating and vertical turbine pumps in the rapidly expanding Southern Louisiana petroleum and chemical industries.

Black & Decker—Southeast

The appointment of A. LEE PROCTOR as Southeastern District Sales Manager for THE BLACK & DECKER MFG. CO., TOWSON, MD., has been announced recently.



A. Lee Proctor, now Southeastern District Sales Manager for *The Black & Decker Mfg. Co.*

Mr. Proctor joined the manufacturer of portable electric tools in 1924 as a salesman. He has been Atlanta Branch Manager for the last 20 years. In his new capacity, Mr. Proctor will supervise all sales and service activities for the ATLANTA, CHARLOTTE, BALTIMORE, MEMPHIS and MIAMI Branches of the company.

Texsteam Corp.—Houston to Expand Product Distribution

TEXSTEAM CORPORATION, 320 Hughes St., HOUSTON, TEXAS, a division of VAPOR HEATING CORPORATION, Chicago, will now handle sales of Texsteam safety valves, chemical injection pumps, Vapor-Clarkson steam generators, and other products, which were formerly sold through the Bettis Corporation. Sales, which have been made primarily to the oil production industry, are now being expanded to other industries. Texsteam will also distribute products of other manufacturers.



Art Loose, Vice President, *Texsteam Corporation*, Houston, Texas, a Division of Vapor Heating Corporation.

ART LOOSE is vice president in charge of Houston activities. FRANK RICHARDS, formerly with Bettis, will now be associated with Texsteam as sales manager. JOHN SHEESLEY and OTTO SCHOENFELD will continue to be associated with Texsteam.

Houston Operation

During the past three years, since Texsteam has been a division of Vapor, the Houston plant has been enlarged; many new production machines have been installed; and overall production has been increased by changing methods and material movement through the plant. More accurate records of materials and processed parts have helped smooth out the flow of completed machines.

Research and engineering staffs and facilities have been enlarged. Here the new controls were developed to adopt the Vapor-Clarkson steam generators to burn natural gas as well as fuel oil. In the past few months Texsteam has converted a good many of these steam generators to burn natural gas, and they are now supplying processing steam in corrugated box plants, feed mill pellet plants, steam for railroad diesel shops, and other industries.

Texsteam's line of safety valves has been re-engineered for wider application. A new larger capacity chemical injector pump has been developed for use in injecting various types of liquids into other liquids or gases against several thousand pounds pressure.

Plans are under way to build more warehouse space to house a stock of maintenance replacement parts and completed machines. Office facilities are being added for the increased staff.

Along with these changes engineering will continue on the 500 hp steam generator, the company's largest Vapor-Clarkson generator for drilling oil wells and for industrial uses.

G.E. Transformer Plant Planned for Rome, Georgia

A multimillion-dollar transformer manufacturing plant, providing employment for about 1,700 persons, will be built at Rome, Ga., by the General Electric Company, Francis E. Fairman, Jr., general manager of the company's Transformer and Allied Products Division, Pittsfield, Mass., has announced. Its construction will be begun at once and will be completed by mid 1953.

"Construction of the new plant represents an important step in meeting today's business requirements for the proper location of adequate manufacturing facilities near important customer areas, and near the supply of raw materials."

The plant will consist of two large manufacturing buildings, an office building, and a number of outlying service buildings, all constructed of steel and transit siding.

Production at the new plant will begin immediately following its completion, with full production capacity expected to be achieved in 1955.

Some classes of power transformers and large distribution transformers, representing a total of 5½-million kilovoltamperes or the equivalent of 7½ million horsepower of electrical energy, are expected to be produced annually at the new facilities.

Transformer ratings to be manufactured at the new plant will range from 300 kilivoltamperes to a maximum of 7,500 kilivoltamperes, 69 kilivolts and below. Included will be liquid-filled transformers of conventional type, transformers for load center unit substations and master unit substations, and network transformers.

For a Small, Localized Supply of Warm or

HOT WATER

Use

POWERS

STEAM and WATER MIXERS



ECONOMICAL—Quickly pay back their cost. Thousands now in use. *Easy to Install.* Requires steam and water pressures above 10 lbs. Steam is mixed directly with water.

MANY USES—Industrial processes; 180° F. sterilizing rinse water for dishwashers; washing oil drums, trucks, etc.



TEMPERATURE RANGE—Any temperature desired between that of incoming water and 200° F.

HAS PRESSURE EQUALIZING VALVE—which prevents delivery temperature changes caused by fluctuating pressures of steam or water.

SMALL SIZE—½" pipe size can be held in the palm of the hand, has 5" dial; ¾" size has 7" diam. dial.

CAPACITIES—based on steam and water at 45 lbs. pressure each, water at 60° F., and delivery temperature of 160° F.: —½" size —3 gals. per min.; ¾" size—8 gpm. Mixing steam with 140° F. water increases delivery about 75%. Often used as a small booster heater. ***WRITE for Bulletin 358-S***

MAIL TO (SWA)

THE POWERS REGULATOR CO.
ATLANTA, GA., 142 Spring St., N. W.
Please Send Bulletin 358-S and prices

Name ..... Title .....

Firm Name .....

Address .....

news for the South and Southwest (continued)

L. J. Blaize Promoted By Dallas Power & Light Co.

L. J. BLAIZE, Vice-President of DALLAS POWER & LIGHT CO., DALLAS, TEXAS, since 1950, has been appointed Vice-President in charge of Engineering and System Operation. In this new capacity Mr. Blaize will be responsible for the supervision of the Engineering, Distribution and Plant Departments.

A native of Mississippi and a graduate of Mississippi State College, Mr. Blaize spent twenty years in the Engineering and Executive Departments of DP&L before his appointment as Vice-President. In 1944 he was elected to the Board of Directors of the company.

Dryomatic Corp. to Have World-Wide Distribution

DRYOMATIC CORPORATION, ALEXANDRIA, VA., has named the Phillips Export Corporation of New York to handle overseas distribution of its line of fully automatic dehumidification machines, it was announced by ANTHONY HASS, Vice-President in charge of sales.

"The demand for dehumidification equipment in overseas markets is constantly growing," said Mr. Hass, "particularly in port cities and Equatorial points, where constantly high humidities cause millions of dollars worth of damage each year.

"In some areas," he continued, "moisture and corrosion affect foods, machinery, textiles and other goods . . . even when stored for relatively short periods. Dehumidifiers effectively eliminate these unnecessary damages at low cost."

Three standard "packaged" units are available—the largest measuring only 45 in. x 19 in. x 16 in.—designed to maintain relative humidities at any desired level down to 15% in storage places up to 200,000 cu ft.

Originally designed for exclusive use by the U. S. Armed Forces during the last war, Dryomatic Dry Conditioners are continuous adsorption type dehumidifiers, using a combination of activated alumina and silica gel as desiccants. Once a unit is plugged in, it operates on a trouble-free around the clock basis, switching from drying to the reactivation phase without external control.

New York Belting & Packing Names Colgin—Texas, Miss.

Appointment of ANDREW G. COLGIN as sales representative in the east TEXAS and MISSISSIPPI oil fields for the NEW YORK BELTING AND PACKING CO. was announced recently.

He will make his headquarters in Shreveport, La., and will handle the line of conveyor and elevator belting, oil field specialties, hose, molded goods and other industrial rubber products.

Mr. Colgin is a graduate of Louisiana State University. He was formerly employed by the Patterson-Ballagh Co. as a sales engineer in the Gulf Coast oil fields.

National Radiator Co., Tenn.

S. C. BRATTON SALES ENGINEERS, LTD., headed by CECIL BUCK, NASHVILLE, TENN., has been named sales representative in TENNESSEE, east of the Tennessee River for THE NATIONAL RADIATOR COMPANY, Johnstown, Pa.

Mr. Buck will handle the line of residential, commercial and institutional boilers, convectors, radiators and heating accessories produced by the company. He has had engineering experience with Linde Air Products Company, and, for three years, was a heating engineer with the Nashville Gas Company.

G. E. Construction Materials Appoints Bonk—Southeast

The appointment of ROBERT M. BONK as district representative in the Southeastern District has been announced by J. J. Lengyel, manager of General Electric's Construction Materials District Sales.

Mr. Bonk joined GENERAL ELECTRIC COMPANY at Schenectady in 1948. His new appointment covers all Construction Materials product lines for the JACKSONVILLE, FLORIDA, wholesale trading area. His office will be at 1300 Berryhill, CHARLOTTE, NORTH CAROLINA.

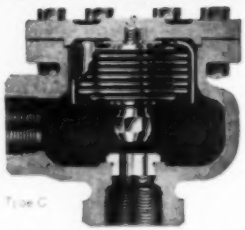
Michigan Tool—La., Miss.

Appointment of OLIVER H. VAN-HORN COMPANY, INCORPORATED, 1742 St. Charles Avenue, NEW ORLEANS 1, LOUISIANA, as LOUISIANA and MISSISSIPPI representatives for gear production and checking equipment and gear cutting tools produced by MICHIGAN TOOL COMPANY, Detroit, was recently announced.

Nicholson Steam Traps

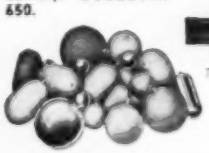
CUT KETTLE TIME 30%

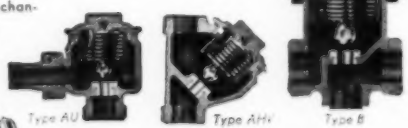
for Leading Processor



Records of a recent installation of Nicholson steam traps, by a large processor, show they cut kettle time 30%. For example, one operation was shortened from 65 to 45 minutes. Nicholson units keep equipment full of live steam because: 1) they operate on lowest temperature differential; 2) have 2 to 6 times average drainage capacity; 3) maximum air-venting capacity. See why leading plants are increasingly standardizing on Nicholsons.

HIGH-PRESSURE FLOATS—Stainless, monel, steel or plated steel. Welded. In all sizes and shapes; for operating mechanisms or as vessels. Quick delivery. BULLETIN 650.





5 TYPES for Every Use—process, heat, power. Size 1/4" to 2"; press. to 250 lbs. BULLETIN 152.

175 Oregon St., Wilkes-Barre, Pa.

W. H. NICHOLSON & CO.

TRAPS · VALVES · FLOATS

Briefs

What Your Leading Equipment and Supply Manufacturers Are Doing

Promotion of ROBERT M. WHITNEY to the position of sales manager, AUTOMATIC TRANSPORTATION CO., Chicago, was recently announced.

FRANK A. BREDE has joined GRATON & KNIGHT COMPANY as Chief Engineer, Transmission and Development, in their Research and Development Department in Worcester, Mass.

H. M. RIVERS, Assistant Director of Engineering Service, HALL LABORATORIES, INC., Pittsburgh, Pa., has been promoted to the position of Director of Engineering Service.

ROBERT E. WORKMAN, formerly St. Louis district manager of GOODYEAR TIRE & RUBBER COMPANY'S chemical division, has been named to the newly established post of manager of commercial development, with headquarters in Akron.

Transfer of TED J. ANGEL, Nordberg Sales Engineer, from Milwaukee to the Company's St. Louis, Missouri. office has been announced by the Heavy Machinery Division, NORDBERG MANUFACTURING COMPANY.

GEORGE T. COLLINS has been elected Assistant to the President of the PENNSYLVANIA SALT MANUFACTURING COMPANY, Philadelphia, Pa.

SYLVANIA ELECTRIC PRODUCTS INC. has announced the appointment of SAMUEL B. WILLIAMS as Assistant to the President. GEORGE W. GRIFFIN, JR., Manager of GENERAL ELECTRIC COMPANY'S News Bureau since 1945, is now Director of Public Relations at Sylvania.

WORTHINGTON CORPORATION has announced three new managers for the pump sections of the Centrifugal Pump Division, including ROY CARTER of the Volute Pump Section; L. H. GARNAR of the Process Pump Section; and I. J. KARASSIK of the Multi-Stage Pump Section.

"Progressive Mechanization" Program Announced by G.E.

A new visual program aimed at boosting American productivity by offering a modern, step-by-step approach to the problems of industrial mechanization, has been announced by the General Electric Company.

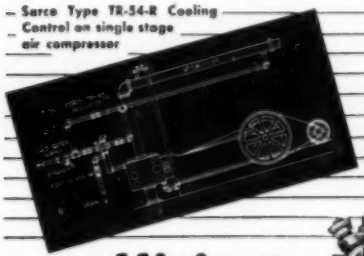
Called "Progressive Mechanization," it is believed by company officials to be the first attempt of its kind to present a concise, workable, consolidation of the principals of production technique and methodology that have made our nation the leading force in world economy.

The new program, 24th in General Electric's now famous More Power to America series, reflects the experience G. E. has gained in promoting production improvements in its own plants.

In an orderly and easy-to-understand fashion, it formalizes the broad and vague aspects of mechanization that, of themselves, are difficult to apply. With documented examples, it presents the stages of mechanization—from the replacement of hand operations by simple machines up through fully automatic continuous-process systems—and makes a deliberate attempt to encourage industrial management to raise each of its manufacturing operations at least one notch in the scale.

Readers who desire additional information can secure a copy of the Progressive Mechanization manual, publication GEA-5789, from the General Electric Company, Schenectady 5, N. Y.

Sarco Type TR-54-R Cooling Control on single stage air compressor





efficient COMPRESSOR COOLING

- Do you want to avoid over — or under — cooling?
- Do you want to save cooling water and lubricants?
- Do you want to increase the efficiency and life of your air compressor? . . . then install SARCO COOLING CONTROLS

Simple • Self-operated • Inexpensive

Sarco TR-54-R

Ask for Bulletin No. 701

SARCO COMPANY, INC.

EMPIRE STATE BUILDING, NEW YORK 1, N.Y.

Represented in Principal Cities

SARCO CANADA LTD., TORONTO 5, ONTARIO

518



FABRICATION and ERECTION by FINNIGAN CRAFTSMEN

Skilled craftsmanship and over 60 years of experience made the erection of the two 40' 0" (dia) x 30' oil storage tanks and three smoke stacks (illustrated above) for Graniteville Company, S. C., a routine assignment.

A wire or letter will bring a qualified representative to discuss your problems with you.

J. J. FINNIGAN CO. INC.

455 MEANS ST., N. W.

ATLANTA, GEORGIA

VERTICAL BOILERS

ALUMINUM • COPPER • STAINLESS STEEL • STAINLESS CLAD TANKS

STEEL SMOKESTACKS • SMOKE BREECHINGS • AIR COMPRESSOR TANKS

• Making Shapes From Boiler Plate Since Eighteen Hundred and Eighty-Eight •

American Cyanamid Builds New Chemical Plant — New Orleans

AMERICAN CYANAMID COMPANY has announced plans to build a fifty-million dollar plant near NEW ORLEANS for the production of chemicals from natural gas. It will be the company's first attempt to make extensive use of natural gas.

The new plant will be located on a 600-acre site in Jefferson Parish, about 10 miles above New Orleans on the West Bank of the Mississippi River. It will consist mainly of outdoor type manufacturing process units with administration, maintenance, warehousing, employee service and control buildings being housed in modern design one or two story buildings.

Products to be manufactured will be ammonia, acetylene and hydrocyanic acid. From these the plant will make acrylonitrile and ammonium sulfate. All are basic materials which provide a foundation for the eventual production of a wide range of hydrocarbon and nitrogen chemicals for industry and agriculture. Acrylonitrile is the principal ingredient of the firm's recently announced synthetic wool-like fiber "X-51." It is also used in making synthetic rubber and plastics.

Construction of the plant is being supervised by Chemical Construction Corporation, a subsidiary of Cyanamid. A general construction contract has been awarded to the J. A. Jones Construction Co. of Charlotte, N. C. New Orleans contractors will participate in the building of the plant. The Texas Company will supply natural gas while power will be supplied by the Louisiana Power and Light Company.

Ferguson Awarded Contract for Hercules Powder Co.

THE H. K. FERGUSON COMPANY, industrial engineers and builders, has been awarded a contract to engineer and build facilities to convert by-product hydrochloric acid to chlorine at the HERCULES POWDER COMPANY toxaphene plant in BRUNSWICK, GEORGIA.

The unit will consist of a large compressor house, a reactor enclosure, and substantial yard equipment, including drying equipment, condensers, pumps and other auxiliaries. Reclaimed gases produced here will be recycled in the process plant for production of toxaphene, one of the most important agricultural insecticides, particularly for use in control of cotton and livestock insect pests.

Because the gases handled are corrosive, the compressor house will have wooden trusses, concrete block walls, reinforced concrete floor, and a roof of a plastic-type translucent material. In addition, incoming air will be washed by venturi scrubbers, and the building will be kept under positive pressure. The reactor enclosure will be of structural steel and corrugated asbestos siding.

Construction of the plant is scheduled to begin this summer, and it is expected that the project will be completed by the end of the year.

Karcher Heads A-C, Memphis

H. G. KARCHER, industrial sales manager of the KANSAS CITY, MISSOURI, branch, Tractor Division, ALLIS-CHALMERS MANUFACTURING COMPANY since 1944, has been named manager of the firm's MEMPHIS, TENNESSEE, branch. He succeeds the late G. M. Malmo.

Hewitt-Robins—Kansas City

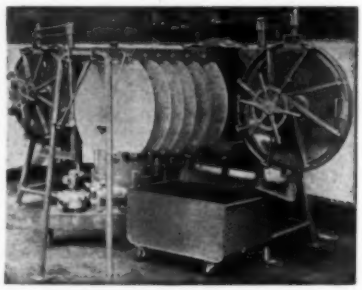
HEWITT-ROBINS INC., Stamford, Conn., manufacturers of conveying and vibrating machines, as well as such industrial rubber products as hose and belting, have opened an additional office in the Porter Bldg., 406 W. 34th St., KANSAS CITY, MO.

In charge of this office will be ROBERT E. CRANE, field engineer, who has been with Hewitt-Robins for 15 years, the last five in charge of the company office in TULSA, OKLAHOMA.

Westinghouse Has Kaiser Order — Chalmette, La.

THE WESTINGHOUSE ELECTRIC CORPORATION has reported receipt of an order for approximately $9,000,000 worth of electrical equipment from Kaiser Engineers, Oakland, Calif., for four new pot lines at the Chalmette aluminum reduction plant of the KAISER ALUMINUM & CHEMICAL CORPORATION. Addition of these lines will give the Chalmette plant, located near NEW ORLEANS, LA., a total of eight pot lines and will double the plant's capacity.

The order includes four 72,000-amp, 750-volt d-c rectifier units, one for



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each of the four pot lines. Each 72,000-amp rectifier will be made up of six 12,000-amp units, each consisting of two 6,000-amp twelve-tank ignitron rectifier assemblies.

In addition to the rectifier units, Westinghouse will supply the transformers and associated switchgear to control the anode and cathode circuits of each 6,000-amp assembly, and will include centralized control and supervision apparatus for the 13.8-kv, 3-phase, 60-cycle circuits of each 72,000-amp unit.

Each of the four new lines has 144 pots and will produce 50 million pounds of aluminum per year, increasing the capacity of the plant by 200 million pounds per year.

The electrical equipment for the new plant is scheduled for delivery by December 1952, and all eight pot lines for the Chalmette plant will be in operation by early 1953.

Borden Company Plant—Demopolis, Alabama

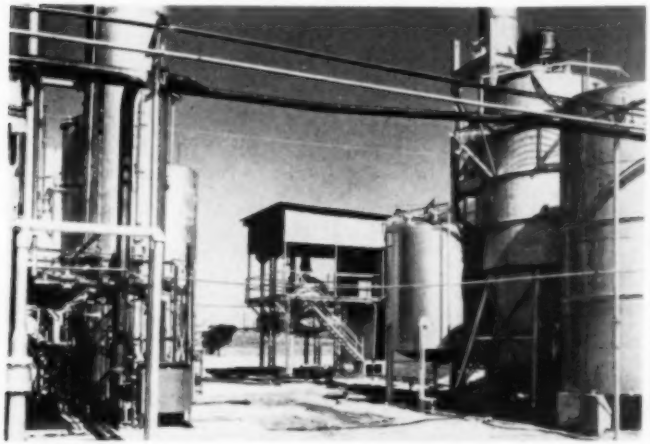
THE NEW Chemical Division plant of the Borden Company at Demopolis, Alabama, consists of a main building, office and laboratory, and other outbuildings to house machine shops and employee service facilities. All production units—formaldehyde, reactor to make resins, storage tanks and towers, and other processing equipment are out in the open.



BORDEN THUMBNAIL — Producing formaldhyde, synthetic resins and "hexa" for woodworking plants, textile mills, plastic manufacturers, and foundry operations throughout the South and Southwest. Formaldehyde will be used principally by the Demopolis plant itself and its sister Borden plant at Kernersville, North, Carolina.

Walter H. Dittrich, Manager of Borden's new Demopolis, Alabama, chemical plant, shows how this complete instrument panel makes possible one-man control of the formaldehyde operation. Looking on are *J. H. Kinzer* (left), District Manager of the Alabama Power Company, and *Henry Whitfield*, President of the Robertson Banking Company of Demopolis.

Principal units of Borden's million-dollar outdoor chemical plant. Formaldehyde is manufactured in the equipment at the left, the resin kettle is in the center, and the reactor at the right.



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Catalogs and Bulletins

These plant operational aids start on page 16.

Free additional information is available to readers of Southern Power & Industry. Check item number on the postage free service coupon post card—page 17.

B-10 **V-BELT DRIVES**—Catalog Section 50A, 32 pages—Simple formulas for standard quarter-turn and V-flat drives are augmented by tables of drives in all belt sections, which have been compiled for quick selection of drives of required ratio and speed. Includes engineering information on other types of V-belt drives. — FORT WORTH STEEL & MACHINERY COMPANY, P. O. Box 1038, Fort Worth, Texas.

B-11 **WATER TREATMENT**—Bulletin, 6 pages—Describes the Sola process for treating industrial and potable water. Device, functioning on a catalytic process is claimed to eliminate scale formation and corrosion in boilers, heat exchangers, and other process equipment. Discusses process, installation, operation, applications, and servicing. Ten installations most usually employed in industry are shown with assembly diagrams.—SOLA CATALYTIC COMPANY, 529 Browder St., Dallas, Texas.

B-12 **PARTS CLEANING EQUIPMENT** —Bulletin, 4 pages—Describes Turbo-Blast parts cleaning unit having 13 in. impeller, rotating at 420 rpm to create a fast-cleaning action of the detergent-charged solution, thereby removing dirt, oil, sludge and grease with minimum of labor, as operator is relieved for other work while machine is in operation. Suggests applications for maintenance departments of all types of industrial operations, including four standard models for gas or fuel oil.—STORM-VULCAN, INCORPORATED, 2225 Burbank St., Dallas 19, Texas.

B-13 **DUST CONTROL** — Bulletin No. 909A, 28 pages—Describes Pangborn's industrial dust control system and its applications. Case histories are supplemented with photographs and performance data. Lists specifications, construction details, and engineering information.—PANGBORN CORPORATION, Hagerstown, Md.

B-14 **SILICONES**—File VSA 1, 4 pages—Gives facts on Valve Seal A, a special purpose silicone lubricant, especially applicable to chemical and food processing industries. Tables evaluate performance in over 120 different chemical and gas services. — DOW CORNING CORPORATION, Midland, Mich.

B-15 **INDUSTRIAL FLOOR MAINTENANCE**—Brochure, "Floors Without Flaws"—Practical guide for economical and efficient care of floors in industrial plants; covers the conditioning, repairing and maintenance methods for a variety of floor materials: concrete, asphalt tile, cork, linoleum, magnesite, terrazzo, and wood.—A. C. HORN COMPANY, INC., 10th St. & 44th Ave., Long Island City 1, N. Y.

B-16 **REFRACTORIES** — Bulletin, 6 pages—"Plibrico Refractory Products for Firebox & Other Heating Boilers" covers application of monolithic linings to firebox and similar types of heating boilers, including air cooled as well as solid refractory construction. Contains complete engineer's specifications for the refractory lining and outside wall construction (either brick or steel) for boilers of this type.—PLIBRICO JOINTLESS FIREBRICK CO., 1805 Kingsbury St., Chicago 14, Ill.

B-17 **CUTTING TOOLS** — Catalog No. 152, 8 pages—Describes Guillotine line of portable hydraulic cutting tools; gives uses, capacities, specifications, and variety of industrial applications; lists accessory equipment such as gauges, control valves, hot cutting units, hydraulic pump accessories. Illustrated.—THE MANCO MFG. CO., Bradley, Ill.

B-18 **STEAM GENERATORS** — Bulletin No. 1050, 8 pages—Covers line of Amesteam Generators. Describes construction of the unit and lists auxiliary equipment in detail. Contains blueprint, with dimensions, of a typical boiler room layout.—AMES IRON WORKS, Box R-1, Oswego, N. Y.

B-19 **VACUUM DEAERATOR** — Bulletin No. 3698, 8 pages — Outlines how the new vacuum deaerator removes oxygen and free carbon dioxide from water so as to protect piping, steel tanks, and other equipment from the harmful effects of corrosion. Illustrated with diagrams and equipment photographs.—THE PERMUTIT COMPANY, Advertising Department, 330 West 42nd St., New York, N. Y.



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B-20 **SMOKELESS FUELS**—Bulletin 11, 16 pages—Describes "Stilcok" process for smokeless fuels, or coke, made in "Stils", in which the heating surface, radiator, or oven, is inside the material, by which method of heat application any carbonaceous substance may be distilled for recovery of its base constituents.—STILCOK COMPANY, 1260 N. Mar Vista Ave., Pasadena, Calif.

B-21 **WIRED TELEVISION** — Bulletin 1025-A, 4 pages—Describes the new Model 300-B Diamond "Utilscope" (wired television), for industrial applications. Illustrated with equipment photographs and diagrams of circuit design. Dimensions of models available are included.—DIAMOND POWER SPECIALTY CORP., Lancaster, Ohio.

B-22 **HUMIDITY CONTROL** — Bulletin K-152, 8 pages—Describes actual installations of Kathabar humidity conditioning equipment in the fields of laminated safety glass manufacture, pharmaceutical processing, moisture-sensitive products storage, hygroscopic powder packaging, and comfort air conditioning.—SURFACE COMBUSTION CORP., Toledo 1, Ohio.

B-23 **AIR FILTERS** — Bulletin 100, 8 pages—Describes "Staynew" ventilation and air conditioning filters for industrial use. Contains specifications, and engineering and performance data, covering various types of filters for removal of dust and other foreign matter by the impingement method. — DOLLINGER CORPORATION, 11 Centre Park, Rochester 3, N. Y.

B-24 **INDUSTRIAL TRUCK ATTACHMENTS — Catalog 553, 24 pages—** Features attachments, tools and accessories for use in handling materials with Hyster industrial trucks. Includes model views, diagrams, specifications, action pictures, and explanatory text. — HYSTER COMPANY, 2902 N. E. Clackamas St., Portland 8, Oregon.

B-25 **ZEOLITE SOFTENERS** — Publication 4529-A—Describes sodium zeolite water softening process, including glossary of terms used in explanation, data for laying out a zeolite softening plant, factors governing size of equipment, selection of materials, and four stages of operation.—COCHRANE CORPORATION, 17th St. below Allegheny Ave., Philadelphia 32, Pa.

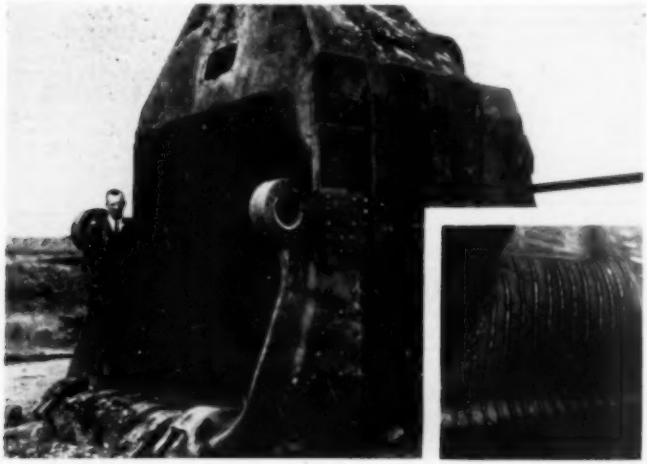
B-26 **SPEED REDUCERS**—Bulletin G-WWH, 48 pages—Describes line of double worm and helical worm gear speed reducers, with complete data on horsepower, output torque, and center distances for reductions up to 6400:1. Gives detailed information on selection of double reduction gearing, examples of selection, horsepower rating tables, dimension sheets, and other data.—DE LAVAL STEAM TURBINE COMPANY, Trenton 2, N. J.

B-27 **SPREADER STOKERS** — Bulletin SB-42-5M-3-52, 16 pages—Dumping Grate type spreader stoker and "Travagrate" spreader stoker are described, with typical applications, operation and design features, specifications, and illustrations including cut-away views and detailed photographs.—ERIE CITY IRON WORKS, Erie, Pa.

B-28 **INDUSTRIAL PUMPS** — Bulletin No. P-151, 8 pages—Illustrates and describes a complete line of high pressure industrial pumps recently introduced and including two and four-cylinder reciprocating pumps in eight sizes with capacities from 3½ to 60 gpm and pressures from 350 to 1000 psi.—THE ROYALTON COMPANY, INC., Gasport, N. Y.

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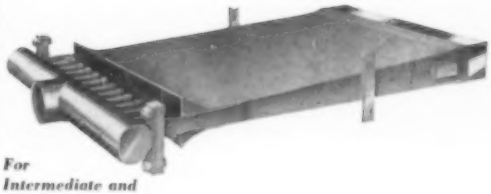
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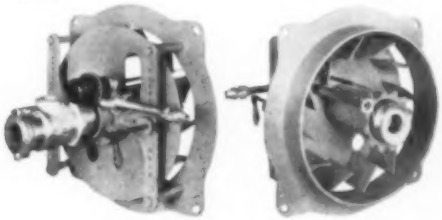
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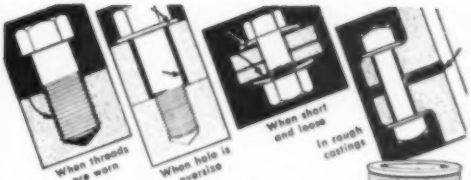
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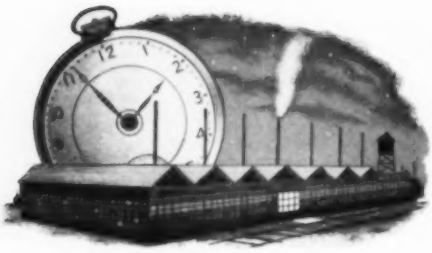


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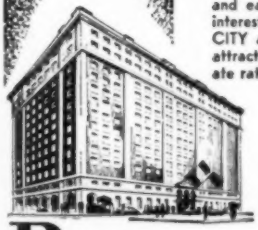
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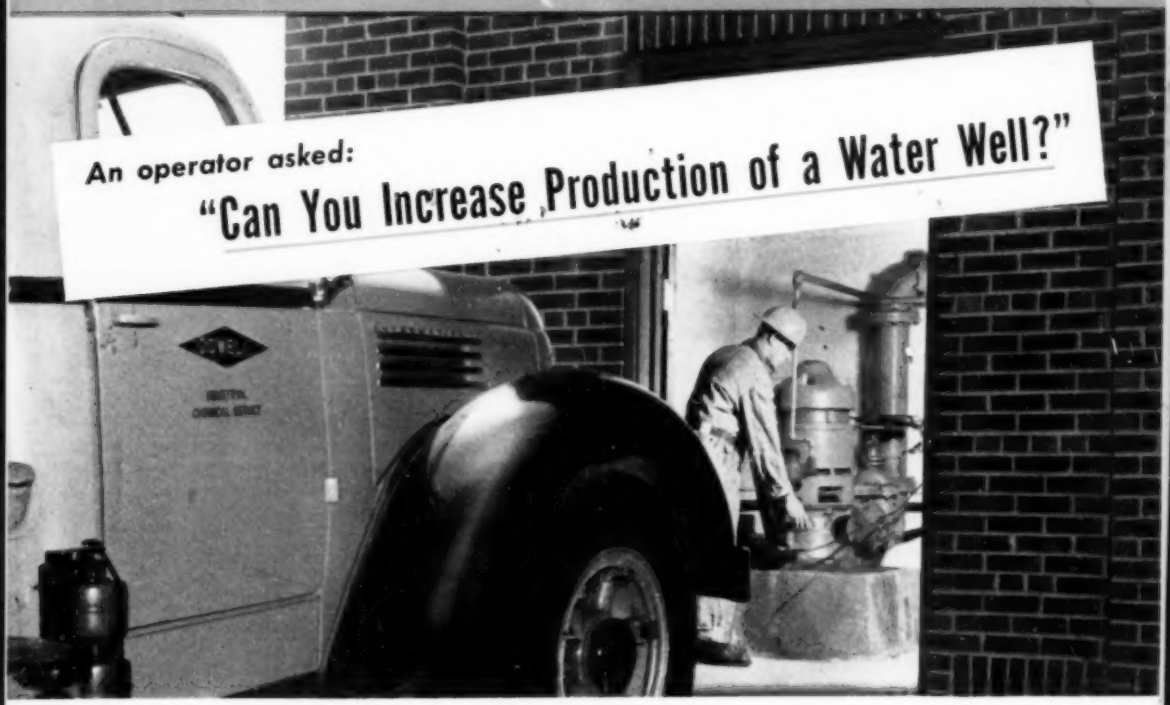
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